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An Amiga Specialist Publication

FEBRUARY 1985

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Our COMMENT

Heed the editor's warning about computers that talk too much.

I have a dream. Well, it's more of a nightmare really. I am awoken in the morning by my alarm clock but instead of an insistent and irritating beep it is programmed to cause me to sleep in sweet and pleasant times. I sleep it soundly. No longer do I drive to work in a grumpy and half-awake silence. Instead, I have to listen to the prattle of my car as it asks how I sleep, what sort of evening I spent (I was talked at by the carbide rebar) and what I ate for breakfast. My word-processor is so called because it talks all day. Its vocabulary is larger than mine (no cheap jokes please). My printer day is spent listening to an artificially intelligent bubble.

It's started already, of course, and with the Commodore 64. We all know that the 64 has one of the best sound generating chips of any computer on the home market. Soon it may even top of selling us so. However for the moment it is still finding its voice.

So, what are the tell-tale signs, the first listening syllables? Not Murray or Daphne, ah no, but "It's time to eat" and "Dinner from my robot". These immortal words appear on two of the best games on the market at the moment, Ghostbusters and Impossible Mission. Soon all computer games won't just be doing the nifty stuff to you but recounting all the gory details as well.

Fortunately, we do still have some control over the noise mouth. Speech synthesizers may be the computer's voice but for the time being we tell them what to say. Our review of those speech synthesizers in this issue will show you how your 64 is already loosening up its tongue. Be warned.

Now, you're probably saying that I'm slightly paranoid. It's fun to hear your computer talk, to create different characters in your games and for them literally to be told by your computer to do something rather than to read it on the screen. But already from America we hear stories of automatic doors expressing the

wish that those who pass through them will 'have a nice day, now'. When I'm in the habit of talking to doors, I shall be grateful for the greeting.

Of course, my tongue is in my cheek. Better that than to be tongue tied by a talking computer, it might just not be the ghost in the machine which has the last laugh (see Ghostbusters) but the machine itself!

And what of my dream? Like all such visions it passed at the first sound of the alarm clock. I sleep at the clock. After all, it is one of those new voice recognition ones.

Your comment

We're overwhelmed. By what? By you, of course. We called for reviewers and you answered, in your hundreds. We asked for your comments and you sent them to us. Not everyone could be a reviewer,

unfortunately, there's just not enough software to go round. But we read all the letters and enjoyed them all; the standard was so high that it made the task of choosing almost impossible. If you haven't heard yet, please bear with us as we're still trying to let everyone know whether they have been accepted.

Similarly, if you've written to us about the magazine, or with a problem or just about Commodore computing in general, we haven't forgotten you. It may be some time before we get round to replying but you can be sure that we have taken note of what you have to say. For example, Dennis Nugent of Swindon writes: "By the way, could you print one or two C64 programs in your stunning mag., P.B. Your magazine is probably the best, most economical and informative mag for Commodore users..." I don't know about the 'probably', but how could we refuse a request like that. Dennis, turn to page 34...



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FEATURES



Gone are the days when the only noise coming from your Commodore was the occasional beep. Computers are now capable of sound, music and even speech. Four Commodore models have two speech synthesizers — from Jamsil and Camlin.

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End up with the standard Commodore printers? We help you choose a printer interface and open up a whole new world of printers to use with your C128B.



With the right software and peripherals, such as keyboards, the capabilities of the Commodore 16 chip can be stretched to the full. Two devices which claim to do this are Macroboard and Commodore's Mega-Tracker.



The Plus/4 is Commodore's new machine for the more serious home user. After reviewing the hardware last month, we now look at its four integral programs — word processing, database, spreadsheet, and business graphics.



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 Editor: Wendy J. Pajmeyer
 Deputy Editor: Kevin Cox
 Editorial Assistant: Steve Hall
 Advertisement Manager: Mike
 Bryant
 Advertisement Copy Control:
 Larry Champion
 Chairman: Joe Carroll
 Chairperson: Henry Typenwing
 Secretary: John Deaton

Editorial & Administration Office
No. 1 Golden Square,
London W1R 3AB
Telephone: 01-477 8616
Fax: 01-477 8616

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Let your 64 answer
back with some sound
advice from David
Crisp.

SPEAKER'S CORNER

THE CURRAH SPEECH UNIT is a small black box which plugs into the cartridge port of your Commodore with a three-pin DIN plug which then plugs into the audio/video socket. Two problems arise from this above arrangement. First if you use a Commodore monitor then your audio/video socket is in use and you would first need to wire the speech unit into the monitor plug. Now a temporary alternative to this means that your speech unit is permanently attached to the monitor. It is not an insurmountable problem but will require a bit of work with cutters and a soldering iron. The second problem arises if you have an SX-64. This once again needs cutters and a soldering iron. The audio video socket and the cartridge port are a few inches further away on the SX and so it is necessary to splice in a couple of inches of extra wire between the plug and speech unit in order to plug it in. It is only a couple of inches but still a nuisance. If you have a standard 64 and use a TV as opposed to a monitor then it is a simple plug in job and this will apply to the majority of, in most cases, the above is not relevant.

Once it is plugged in it is very easy to use. I had my five year old daughter using it in just a couple of minutes. Before now the only speech units I had used were for the Spectrum and the BBC, and to achieve them it was necessary to look up the sounds you wanted to use, note the number of the sound, and then put these into some form of list. What appeared on screen was simply a list of meaningless numbers which my five year old had to enter into a reasonably sound. Not like that with the Currah. First you select the unit by noting the status number it tells you (single type SAY, tri- and 40880, 40880, 40880) and to have it off you type 4048. It is really as easy as that. These commands



can be put into a program or used as direct commands.

Talk to Me

If you type in as a direct command 'TALK' the speech unit will SAY the letters of the type from the keyboard. All were understandable except for the status key which to me sounded like a muppet with a speech impediment saying WAGGLES. And why, why, why, the dreaded American 1100 when I am sure most people in this country say 210. These things apart it was everything. It is a realistic voice and not human sounding but it will carry far and be understood. There are two voices one high

and one low and intonation is possible but not quite so easy to get right. A very clever piece of programming has put banks of speech into the unit and in the majority of cases it works exceptionally well. By way of speech I mean that if you type SAY "hello" and then SAY "HELLO" then both sound the same as they should. Very clever that and off course, Currah can say the most obscene sounds it is called the basic SAY command to include exclamations for particular sounds. It does not but I found it easy to write the word as it sounds it. To say 'Hearst' try typing SAY "Hearst". This

works very well but I found SAY "HEARST" later introduced to work out with a more correct result. This only goes to show how realistic this unit is. There is a speech buffer which holds about thirty sounds worth of speech which means the program can carry on after speech is output. It is also possible to program the unit through machine code. Currah up it is difficult and not tried. Believe me it is. It is so hard to use through BASIC it would be easier to exit from the loaded program, return to BASIC, say what you have to and then return to code.

To use up there, this unit is very easy to use and easy to get



good results from. How useful or additional to it is, is difficult to say but without doubt it is a lot of fun. I keep plugging it in and having another bash.

All the speech units I have heard have been male voices. I would like to hear one with a female voice.

Jamar Speakeasy

Another speech unit has just arrived and this one is made by a Yorkshire company. The Jamar Speakeasy is a self-contained box which, in the case of the kit, is plugged into the user port. It is claimed to be compatible with a long list of machines and list of models with the relevant interface cable. It is a two-tone unit with a built-in speaker and has a slightly cheap plastic feel. On my review model the speaker grille was messy as many of the slots were gummed up with resin. The interface cable was a short piece of ribbon cable with an IDC type connector at one end. The other end was a plug to match the user port. This plug was marked for Channel A/B/C/D and to the wires of the ribbon were exposed. It is possible to get covered plugs and so I cannot see why the correct plug has not been used. This is a small point but reflects the general cheap finish of the unit.

Back to the book

Before I plugged the module in I did, as always, fully read the instruction manual. This was small print and the cheap paper got me off but I persevered. However of course this unit requires a mass of meaningless numbers in order to get anything out of it. On the Canish unit to say "Computer" you type "MY COMPUTER" however on the Jamar unit you type "8,2,4,3,6,5,4,5,1,3,3,4".

Which do you prefer. I soon made up my mind. I eventually forced myself to plug in the unit and find out. It was first supposed that a short program was loaded in to set the speech unit up. This done, I typed in a few of the numbers needed to make it say simple words. Chatter away it did and another few numbers made a few more words. After the hour with all this it was possible to get the Canish going, the number in manual gives a definite reply. Constantly referring to the manual for the

appropriate number to say the sound is a long winded procedure. I know that not long ago the more easy way was the only way to get speech out, but the Canish shows that this is no longer the case. I tried to make up new words which were not in the manual. It can be done but believe me it takes a long time. Because there is no meaning to the numbers I feel that it would even be difficult to learn which number made the appropriate sound even with a list of lists.

Talking OK

All said and done, the quality of the speech was OK. Quite

good in fact but will not go on long enough to make edge for this one as opposed to the Canish. The manual and the finish are not a patch on the Canish and at least the Canish did work first time. (The first Jamar did not work and so I had to wait for a replacement).

The Jamar unit costs about £5 more than the Canish unit and you still need to pay another £4.50 for the interface lead. So in the end you pay £70 more for a less desirable unit. The following appears to be a comparison between the two units.

MINIMUM COMPATIBILITY
No other machine though other versions of the Canish may be purchased.
VALUE FOR MONEY *****
EASE OF USE *****
DOCUMENTATION ****
OUTPUT *****
PRICE £29.95

SPEAKER COMPATIBILITY BBC, DRAGON, DEC, SHARP, VIC, etc. **REACTIVITY** COLOUR GEM will work relevant interface cable.
VALUE FOR MONEY **
EASE OF USE *
DOCUMENTATION **
OUTPUT ***
PRICE £14.95 inc. VAT + £4.50 for interface cable. **TOTAL** £19.45



A L I E N



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Old the record

TWO BIG RECORD COMPANIES ARE making a song and dance about entering the software market. They are CRI and Anisette, which is connected to Anis Records. The initial push for both companies is for the Commodore 64, for the time being, however, they are importing existing software from the US.

CRI have started rather modestly with 8 titles eg. Breakdance based on the lame dancing craze, and Impossible Mission, an arcade, adventure, strategy game of mind-boggling complexity — and it's got brilliant graphics. All are from Egypt who are famous for business games and most of their titles are in Italian.

There was nothing modest about

Anisette's launch. They fired the Hippoboscus in London's West End for the right to tell the world about their first twelve titles. All imports again but they include at least two US Number Ones. Some are now getting a bit long in the tooth, like Lyle Kuaner but the selection does include some brilliant games.

Fortunately, neither company rules out the possibility of commissioning home-grown software and with their funds and knowledge of a very similar market they look assured of success. Whether other software houses will be dancing to their tune in the near future remains to be seen.

CRI in fine voice

CRI'S LATEST PROGRAM IS SPARKLED with liberal doses of culture. Initiated by Ian and Isobel, and featuring little more than Wagner's opera of the same name, it should be available around the middle of December.

It was written by a 21 year old student at Heidelberg University, and CRI have been given the rights to market the product in English speaking countries.

The program will come with a booklet and will cost £8.95.

CRI are at CRI House, 9 Kings Yard, Casemier's Road, London E7 2HD; tel. 01-332 2910.

Up a gumtree

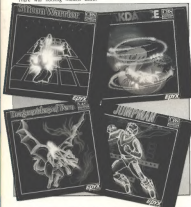
UPPER GUMTREE IS A GRAPHIC ADVENTURE by Peter Cooke from Richard Shepherd Software which also includes an element of detective work.

Upper Gumtree is, apparently, the most boring place in the world until strange and terrible things begin to happen. When Professor Bloominde moves in with a lot of old machines looking gadgets, your aim is to uncover the professor's evil plot to end civilization as we know it. Working in the dark, you must unravel the mystery, discover the threat to civilization, find a solution and cope with the professor.

This game is filled with a selection of interesting characters apart from the dubious professor. Your attempts to save the world may be eased — by questioning them.

Time plays an integral role in the scoring system of Upper Gumtree. Richard Shepherd Software intend to present certificates (signed by Peter Cooke and Richard Shepherd) to top Upper Gumtree players who have completed the adventure in the shortest Gumtree Game Time.

Upper Gumtree will be available on tape instantly at £6.95. Richard Shepherd Software can be contacted at Elm House, 22-24 Elmfield Lane, Slough, Berkshire; tel. 06286-60033.



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High speed games

INTERCEPTOR SOFTWARE ARE TO RELEASE two new titles for the Commodore 64 — announced their new Microload system — a high speed loading technique for the Commodore 64. Interceptor claim that this new system loads programs into the Commodore 64 at around 8000 baud as well as displaying a smooth scrolling screen message, a high resolution colour picture and plays music — all while the program is loading.

Interceptor Software can be contacted at Lindors House, The Greens, Tisbury, Wiltshire; tel. 07156-77145/7711.

Tidier titles

WARNER WRITERS WIFE CLEAN COMPILER labelling kits claim to enable the user to title their programs (on cassette or disc) simply and clearly thus eliminating the mess you get with the pencil/eraser combination. To alter the title, you wipe the label clean with a damp tissue and retitle.

The kits include 12 specially designed labels, the WRITERS pen and a set of alphanumeric mini labels for indexing and permanent information.

WRITERS Computer labels cost £3.49. Warner WRITERS kits at 23 Warner Road, London SW15 3LJ, tel. 07-788 1702.

Heroic adventure

SPIDERMAN, THE LATEST SCOTT ADAMS' adventures from Adventure International, was delivered safely into the hands of Arnie Dealer (100 Ltd), who will be distributing it by Spiderman and The Incredible Hulk, at the end of November. Spiderman will be available on a number of home computers, including the Commodore 64. It will cost £9.95.



New software houses

TWO NEW SOFTWARE HOUSES HAVE been launched. They are Lighthouse Software and Ophrys.

Lighthouse Software was launched by a team headed by Mark Mashings, co-founder of Bubble Bus Software. The company hope to produce and publish a range of products for most makes of micro computers. Lighthouse will be encouraging links with freelance programmers alongside producing in-house products.

Ophrys has been initiated by three Oms Software personalities. — Paul

Rodman (Managing Director), Colin Barrett (Financial and Administrative Director), Geoff Phillips (Software Director). The company is based just outside Cambridge. It will initially launch three Oms Lighthouse titles but there will be followed by titles for other machines, including the Commodore 64.

Lighthouse software are based at 28, The Boundary, Langton Green, Sandridge Wells, Kent, TN3 9PA. Ophrys are based at The Smeth, Unit 3, Church Farm, Marley, St. George's, Nr. Sandy, Beds, SG7 9HP.

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Best of British

PSYCHIC ENGINEERING CONTROLS Group have designed *Society of Fortune* for the English Software Company. This is a multi-screen arcade adventure set in a team in which you encounter werewolves, mummies, snakes, bats, blood thirsty cave birds and lots lots more in your quest for

gold.

Another new game from The English Software Company is *Henry's House* in which little Henry takes the player for a tour through his new home. The game features hi-res graphics and is written in 100% machine code.

Henry's House costs £3.95 in cassette. Both games are for the Commodore 64. The English Software Company are at Box 43, Manchester, M44 1AD, tel. 061-811 1750.



Fleeing from the Fuzz

LONGMAN/NOBOLISTIC SOFTWARE have released *Agent U.S.A.*, an arcade strategy game for the Commodore 64. The player's aim as *Agent U.S.A.* is to save the U.S.A. from the rapidly advancing Fuzz after a futuristic lurking in a U.S. city, allowing everyone who touches it and turning them into fuzzbodies. You must race against time, building up your defenses while shelling on the advance of the Fuzz; then you catch a train, speed into the heart of Fuzz territory, find the bomb

and destroy it.

Agent U.S.A. has been produced by Tom Snyder, a top American games designer. It is available on cassette at £6.95 for the Commodore 64 and £8.95 at £7.95 on cassette and £14.95 on disc.

Longman Software can be contacted at Longman Group Ltd, Longman House, Burnt Mill, Harlow, Essex CM4 9JH, tel. 0274-267221.

New Mastertronic label

MASTERTRONIC HAS LAUNCHED A new adventure games label — *Master Adventures*. Titles on this label will cost £2.99 and £3.99.

The first title to be released on the Commodore 64 is *So-So's of Death*. Another game, *Black Crystal*, is due out for the Commodore 64 in the new year at a price of £3.99. The package includes two cassettes and a book. 40

Mastertronic are at Park Lane, Park Road, London NW6 7UL, tel. 01-492 1176.



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Holiday competition

COMMODORE COMMUNITY AND THE Spectrum Group PLC are sponsoring a competition to win a holiday in Florida. The holiday package includes a visit to Disney World, a guided tour of the Kennedy Space Center, a trip to Florida days and an accommodation in the Shagun Wood Hotel and breakfast at Sand Ray Hotel

as well as £1000 spending money. The winner can also take three friends. The holiday must be taken during the first ten months of 1991. The prize is open-up will require £100 gift vouchers to spend in any Spectrum Group approved dealer store in the United Kingdom.

The competition involves being in

order of importance given features on the new Commodore Plus/4 and completing a ten-kyler.

Spectrum Group plc are at Hunting Gate, Hadden, Herts, SG4 6TJ; tel: 0431-57171. Further information can also be gained from Commodore Publishing on 01-481-1151.

Ship Us a Star

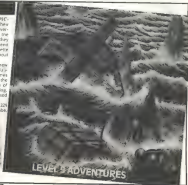
LEVEL 9, THE ADVENTURE GAME SPECIALISTS have just announced that all their games will be available soon in disc versions. Anyone who already owns the cassette need not be bothered as they would rather have discs. Level 9 will send you the star if you send them the cassette and the address, which should be about £2.95.

Another innovation is their new catalogue. They have designed it as a full-colour A4 poster with the games described on the back. The picture on the front will be changed every couple of months, so if you want to start collecting, send a large stamped and self-addressed envelope to Group 9 now.

The address is Level 9 Computing, 224 Highfields Road, High Wycombe, Bucks HP12 3PG.

The Magic Sword

AN ADVENTURE
A LARSENSEN



Educational fairytale

DARLINGTON PUBLICATIONS OF STOCK port have just released an educational adventure, 'The Magic Sword' for the Commodore 64. It contains a 48-page colour book to set the scene, as well as a software cassette which enables the child to participate in the subsequent adventure.

The child is transported into a magic

world of a fairytale prince, a beautiful princess, a castle with secret passages and dungeons, dense forest, deep caves and a wicked house in which there lives a wicked witch. The child has to travel through the countryside and explore the castle to find the princess and rescue her from the wicked witch. Various magic objects must be found to reach the end of the story.

All the text is in double-height characters to make it easy to read and a compass on the screen throughout the game points out the directions in which moves are allowed.

The Magic Sword is available on the Commodore 64 for £19.95. Darlarton Publications are at Europa House, 48 Chester Road, Hazel Grove, Stockport SK7 2JH; tel: 061-496 8181.

Data Statements

Broad (mixed)

ARCUS PRESS SOFTWARE HAVE announced that their next game under the Mind Games title will be entitled Royal Secret. It will be based on the novel Paul McCartney film. Give My Regards to

Broad Street. Its programmers are Concept Software—the creators of AP's last game, A Ace.

Royal Secret should be available on the Commodore 64 at the end of January.

PS5 (single)

THE ADVENTURE GAME TWORDS AND TARDIS, should be available on the Commodore 64 in January 1985. The program will consist of 66 screens, 415 locations, an 8000 dictionary, almost 2,000 objects and over 4,000,000 ways to be killed.

Mike Simpson, who is Swords and Tardis's programmer, spent over 18 months planning and developing the program. He claims that the program will run in Real Time, will be fast menu driven and that the player will be able to control weapons during combat sequences. There are a series of quests within the game.

PS5 are at 412 Henry Station Road Coventry, CV4 5XG, tel: 0203-667066.



First Publishing

A NEW BRITISH PUBLISHING COMPANY, First Publishing Ltd, are launching a series of new books and software packages for the Commodore 64. They hope to have a total of 10 books, films and 11 software packages on the market by Spring 1985. Their initial titles include 'Anatomy of the 64' and 'Tricks and Tips for the 64'. Their forthcoming products include 'WordBASE 64' (a data manager) and 'WordWORD 64' (a word processing package).

Data Statements

Frankie go to town

TAMMIE STU HAVE INCORPORATED 8,791 screen locations into their latest game — *Cocaine Hunter*. The aim of the game is to find your way to Caliente Central, the centre of the machine-generated movement. The player must destroy his opponents and clear all the obstacles the computer has put in his way as quickly as possible. If the player does well, he may leap ahead to a further location rather than the next logical location, thus making each game slightly different from the previous one.

The game will be accompanied by a booklet including maps and information. It is expected to retail at £9.95 on cassette and £10.95 on disc.



New Commodore appointments

DAVID GERRARD, Plessey Company's Marketing Consultant with Plessey, has been appointed as Commodore UK's Marketing Manager. His responsibilities include maintaining Commodore's dominant position in the home computer market, establishing Commodore's new products in the market and qualifying Commodore UK's assets on the business computer market in 1985.

Mr Gerrard, also from Plessey, has been appointed as Plant Manager at Commodore's new 200,000 square foot manufacturing facility in Corby, Northants. His job entails managing all manufacturing operations in Corby.

Frankie good to go

ORIAN SOFTWARE HAVE JOINED forces with Island Records and computer producers Jang Tume Tume to produce a Frankie Goes to Hollywood game. The band will receive a royalty from sales of the game. The computer involved sees this as an opportunity to bring together

intimately related industries thus attracting a potentially wider purchasing audience.

Although details of the game have not yet been released, the new Frankie game should be available in the early Spring of 1985 with a retail price of £9.95.



If you've got any useful advice to give Your fellow Commodore readers or any problems with which you need our experts' help, put pen to paper.

INPUT

I have successfully read and used the "Turbo 64" program from the December 1984 edition of "Your Commodore". But, I find the directions in your magazine rather difficult to follow. Please could you explain how to load and use any of your BASIC programs to run on the Turbo 64 format?

J. E. O'Donnell
Lima

OUTPUT

We have received a lot of queries regarding this program so here is how to use it:

Type in the program exactly from the listing on pages 28 and 29 of the December issue, with the asterisk to lines 254 and 262 from last month's issue.

BASIC EDITING the program, when it all enters the name "Turbo" or similar. Now **RUN** the program and it will read in the data. This will take a little time. Once this is done, you will be asked if the program has been saved. This question refers to the BASIC load program which we saved off before **RETI**ing this part. Therefore, our answer is "Y" and press **RETURN**. The program now exists as one file when listed. Having done this, a prompt will appear on the screen. Press **RECORD** and **PLAY** and the loaded program will be **SAVED** as "T 64". Make sure you do not overwrite the BASIC loader program on the cassette when **SAVING** as if something does not work you will not want to retype the listing.

To use the utility type the following:

```
LOAD "T 64",1,1
RUN
END
```

The Turbo mode is now in operation and all of the commands on page 28 should now work. Please note that any software must be **SAVED** using this utility before it can be loaded using it. Then you cannot use this utility to load your existing software until you have used that software using the "C" file name" command.

INPUT

INPUT

We purchased a Commodore 64 computer, with a display monitor, a VIC 1640 for a single drive floppy disc and an APP-640 Data Matrix Printer in order to computerize our accounts.

So far we have a program which enables us to print the accounts, the payments and the statements to the cards. This program was prepared by a friend.

Now we want to buy a program which will enable us to computerize all our accounts and records.

Will you please advise us as to the most appropriate program for that purpose? *Clifford Thomas Ltd, New Windsor*

OUTPUT

There are a number of accounts packages available for the 64. Take a trip to your local business computer shop and ask to see some of them demonstrated. The cost of programs produced by Amiga are certainly a reasonable buy. Their programs started life on the Commodore business machines and the programs tend to be fast, flexible and easy to use. You can get in contact with them at:

Amiga Systems
104 Queens Street
Hammersmith West London

0800 540 100 (telex) (0400) 29001

Note that if your accounts are large and complicated and you intend using your system for other applications, I would recommend buying a business computer now as Commodore business machines have the advantage of being well established and may be networked easily.

INPUT

I am trying to save running programs on a VIC 20. It has a VIC 20 + 1640 from the ROAD (Amiga/Commodore), that is a program that runs programs on the cassette tape

from which the program or tape header I have loaded in disks and magazines but have not found anything suitable for my use.

If you are suggesting any hardware items that I could include in my program I would be very grateful for your help.

A. O'Neil,
Marseilles

OUTPUT

This is possible by making the first program on the cassette load over the VIC routines in page three. This program will have to be **SAVED** as a type three tape file so that it is not reloaded when **LOAD**ed. Make the three channel vector point at a piece of machine code loaded as part of the first program. This machine code can then jump to the BASIC load routine. This is quite tricky but will provide a reasonable level of program protection.

INPUT

I bought a Commodore 64 nearly a year ago to replace a Commodore PET. I have had an intermittent, but expensive, problem with the Commodore 64 that has got me stuck replacing the computer from time-to-time. The Commodore main screen is displayed with the complete loss of the content of memory. The problem is on about 20% of the time, in part it seems, to the power supply but during a major upgrade I had little or no effect. I still have the PET and that runs and runs without any problem. The resetting of the machine occurs most frequently when it hours mode. Can you advise me of how I may cure this fault?

D. J. Clark
Bristol

OUTPUT

A common and annoying problem — my fridge causes the same. Expensive main suppressing. (1200 words!) made no difference. I suggest you move house or change all other electrical equipment or buy a new computer. Seriously though, it is common to equipment with where that switch is and out. Also it appears to be a problem only associated with the early 64's only.

OUTPUT

E

This month, **Byte**
Phillips shows you
how to add a
professional touch to
your programs
through, for example,
memory expansion or
stylish introductions.

VIC GAMES PROGRAMMING

HOWARE YOU? YOUR idea for a program, and however well you write the main program, the whole thing can be easily spoiled by poor presentation. There's nothing worse when starting off a game, than to be met with an off-colored title, no instructions, and even to be asked to enter your space ship out of the space doors by waddling blindly at first, only to find the game has been written for a pistol! It's important to put these details into your game, together with color-maps such as a high score facility, key/keyboard options, replay facility, and if you can't resist, a hall of fame.

In previous articles I stressed the importance of tight programming—in the main you squeeze it down the more you get it, with the added bonus of faster action. Unfortunately, however hard you try to squeeze down your program, you're still going to be hard pushed to put all the features you might like. Just the title and instructions could take up 1428, depending on your ambitions. And then there's the color graphics; the data statements alone start to eat into your valuable memory and left face it, on the unexpanded VIC 20 you've only got 15K. Or have you?

The two part program

The way round the problem is to write your program as a two part program.

Part 1
Initial title display
Instructions/options
loadchk/keyboard option
Command graphics
etc

Part 2
Game
High score display
Hall of fame
Score update
etc

Things are looking up. If you do this you will have converted your VIC 20 into an impressive PC without adding any expansion. The only problem of course is that the first program is lost when you LOAD the second. As for the title, this would mean the whole thing positions, apart from using the program to give the instructions for the game. When you lose the program, you also lose any key/opts for the variables you have defined in the program. However there is a way round this problem. If you POKE the values for these variables in protected memory using the technique outlined last month, they stay there, waiting to be pulled out in the next program. This is shown again in Listing 1. Line 18 stores BASIC to protect an area of memory for the LOGs (User Defined Graphics — lines 20-75), and the prompt given for the joystick/keyboard options is POKE14 into location 1400 in line 160. To tidy the whole thing up lines 170-200 contain an auto load routine, which will automatically LOAD and RUN the second program.

Now are you LAZY? This program before you RUN it, because otherwise the ALW command in line 200 will ruin all your hard work!

To prove to yourself that this works, enter and SAVE Listing 2 immediately after Listing 1. Now RUN Listing 1, and choose your option. Listing 2 will automatically LOAD and RUN and, as you will see, the customized

characters and the option chosen, are all intact. You've now got plenty of memory left in both parts for the instructions and the game, and with any luck will come to spare for a few special effects.

A few tricks

In the first part of the program pointers are dragged out from the title screen. The only proviso is that the program will take slightly longer to LOAD if

```
1 REM LISTING 1
2
3 REM SELECTED MEMORY
4
5
6 POKE140,0:POKE141,20:CLA
7
8 REM DEFINE LOGS
9
10 POKE142,POKE143,POKE144,POKE145,POKE146,POKE147,POKE148,POKE149,POKE150,POKE151,POKE152,POKE153,POKE154,POKE155,POKE156,POKE157,POKE158,POKE159,POKE160,POKE161,POKE162,POKE163,POKE164,POKE165,POKE166,POKE167,POKE168,POKE169,POKE170,POKE171,POKE172,POKE173,POKE174,POKE175,POKE176,POKE177,POKE178,POKE179,POKE180,POKE181,POKE182,POKE183,POKE184,POKE185,POKE186,POKE187,POKE188,POKE189,POKE190,POKE191,POKE192,POKE193,POKE194,POKE195,POKE196,POKE197,POKE198,POKE199,POKE200,POKE201,POKE202,POKE203,POKE204,POKE205,POKE206,POKE207,POKE208,POKE209,POKE210,POKE211,POKE212,POKE213,POKE214,POKE215,POKE216,POKE217,POKE218,POKE219,POKE220,POKE221,POKE222,POKE223,POKE224,POKE225,POKE226,POKE227,POKE228,POKE229,POKE230,POKE231,POKE232,POKE233,POKE234,POKE235,POKE236,POKE237,POKE238,POKE239,POKE240,POKE241,POKE242,POKE243,POKE244,POKE245,POKE246,POKE247,POKE248,POKE249,POKE250,POKE251,POKE252,POKE253,POKE254,POKE255,POKE256,POKE257,POKE258,POKE259,POKE260,POKE261,POKE262,POKE263,POKE264,POKE265,POKE266,POKE267,POKE268,POKE269,POKE270,POKE271,POKE272,POKE273,POKE274,POKE275,POKE276,POKE277,POKE278,POKE279,POKE280,POKE281,POKE282,POKE283,POKE284,POKE285,POKE286,POKE287,POKE288,POKE289,POKE290,POKE291,POKE292,POKE293,POKE294,POKE295,POKE296,POKE297,POKE298,POKE299,POKE300,POKE301,POKE302,POKE303,POKE304,POKE305,POKE306,POKE307,POKE308,POKE309,POKE310,POKE311,POKE312,POKE313,POKE314,POKE315,POKE316,POKE317,POKE318,POKE319,POKE320,POKE321,POKE322,POKE323,POKE324,POKE325,POKE326,POKE327,POKE328,POKE329,POKE330,POKE331,POKE332,POKE333,POKE334,POKE335,POKE336,POKE337,POKE338,POKE339,POKE340,POKE341,POKE342,POKE343,POKE344,POKE345,POKE346,POKE347,POKE348,POKE349,POKE350,POKE351,POKE352,POKE353,POKE354,POKE355,POKE356,POKE357,POKE358,POKE359,POKE360,POKE361,POKE362,POKE363,POKE364,POKE365,POKE366,POKE367,POKE368,POKE369,POKE370,POKE371,POKE372,POKE373,POKE374,POKE375,POKE376,POKE377,POKE378,POKE379,POKE380,POKE381,POKE382,POKE383,POKE384,POKE385,POKE386,POKE387,POKE388,POKE389,POKE390,POKE391,POKE392,POKE393,POKE394,POKE395,POKE396,POKE397,POKE398,POKE399,POKE400,POKE401,POKE402,POKE403,POKE404,POKE405,POKE406,POKE407,POKE408,POKE409,POKE410,POKE411,POKE412,POKE413,POKE414,POKE415,POKE416,POKE417,POKE418,POKE419,POKE420,POKE421,POKE422,POKE423,POKE424,POKE425,POKE426,POKE427,POKE428,POKE429,POKE430,POKE431,POKE432,POKE433,POKE434,POKE435,POKE436,POKE437,POKE438,POKE439,POKE440,POKE441,POKE442,POKE443,POKE444,POKE445,POKE446,POKE447,POKE448,POKE449,POKE450,POKE451,POKE452,POKE453,POKE454,POKE455,POKE456,POKE457,POKE458,POKE459,POKE460,POKE461,POKE462,POKE463,POKE464,POKE465,POKE466,POKE467,POKE468,POKE469,POKE470,POKE471,POKE472,POKE473,POKE474,POKE475,POKE476,POKE477,POKE478,POKE479,POKE480,POKE481,POKE482,POKE483,POKE484,POKE485,POKE486,POKE487,POKE488,POKE489,POKE490,POKE491,POKE492,POKE493,POKE494,POKE495,POKE496,POKE497,POKE498,POKE499,POKE500,POKE501,POKE502,POKE503,POKE504,POKE505,POKE506,POKE507,POKE508,POKE509,POKE510,POKE511,POKE512,POKE513,POKE514,POKE515,POKE516,POKE517,POKE518,POKE519,POKE520,POKE521,POKE522,POKE523,POKE524,POKE525,POKE526,POKE527,POKE528,POKE529,POKE530,POKE531,POKE532,POKE533,POKE534,POKE535,POKE536,POKE537,POKE538,POKE539,POKE540,POKE541,POKE542,POKE543,POKE544,POKE545,POKE546,POKE547,POKE548,POKE549,POKE550,POKE551,POKE552,POKE553,POKE554,POKE555,POKE556,POKE557,POKE558,POKE559,POKE560,POKE561,POKE562,POKE563,POKE564,POKE565,POKE566,POKE567,POKE568,POKE569,POKE570,POKE571,POKE572,POKE573,POKE574,POKE575,POKE576,POKE577,POKE578,POKE579,POKE580,POKE581,POKE582,POKE583,POKE584,POKE585,POKE586,POKE587,POKE588,POKE589,POKE590,POKE591,POKE592,POKE593,POKE594,POKE595,POKE596,POKE597,POKE598,POKE599,POKE600,POKE601,POKE602,POKE603,POKE604,POKE605,POKE606,POKE607,POKE608,POKE609,POKE610,POKE611,POKE612,POKE613,POKE614,POKE615,POKE616,POKE617,POKE618,POKE619,POKE620,POKE621,POKE622,POKE623,POKE624,POKE625,POKE626,POKE627,POKE628,POKE629,POKE630,POKE631,POKE632,POKE633,POKE634,POKE635,POKE636,POKE637,POKE638,POKE639,POKE640,POKE641,POKE642,POKE643,POKE644,POKE645,POKE646,POKE647,POKE648,POKE649,POKE650,POKE651,POKE652,POKE653,POKE654,POKE655,POKE656,POKE657,POKE658,POKE659,POKE660,POKE661,POKE662,POKE663,POKE664,POKE665,POKE666,POKE667,POKE668,POKE669,POKE670,POKE671,POKE672,POKE673,POKE674,POKE675,POKE676,POKE677,POKE678,POKE679,POKE680,POKE681,POKE682,POKE683,POKE684,POKE685,POKE686,POKE687,POKE688,POKE689,POKE690,POKE691,POKE692,POKE693,POKE694,POKE695,POKE696,POKE697,POKE698,POKE699,POKE700,POKE701,POKE702,POKE703,POKE704,POKE705,POKE706,POKE707,POKE708,POKE709,POKE710,POKE711,POKE712,POKE713,POKE714,POKE715,POKE716,POKE717,POKE718,POKE719,POKE720,POKE721,POKE722,POKE723,POKE724,POKE725,POKE726,POKE727,POKE728,POKE729,POKE730,POKE731,POKE732,POKE733,POKE734,POKE735,POKE736,POKE737,POKE738,POKE739,POKE740,POKE741,POKE742,POKE743,POKE744,POKE745,POKE746,POKE747,POKE748,POKE749,POKE750,POKE751,POKE752,POKE753,POKE754,POKE755,POKE756,POKE757,POKE758,POKE759,POKE760,POKE761,POKE762,POKE763,POKE764,POKE765,POKE766,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1348,POKE1349,POKE1350,POKE1351,POKE1352,POKE1353,POKE1354,POKE1355,POKE1356,POKE1357,POKE1358,POKE1359,POKE1360,POKE1361,POKE1362,POKE1363,POKE1364,POKE1365,POKE1366,POKE1367,POKE1368,POKE1369,POKE1370,POKE1371,POKE1372,POKE1373,POKE1374,POKE1375,POKE1376,POKE1377,POKE1378,POKE1379,POKE1380,POKE1381,POKE1382,POKE1383,POKE1384,POKE1385,POKE1386,POKE1387,POKE1388,POKE1389,POKE1390,POKE1391,POKE1392,POKE1393,POKE1394,POKE1395,POKE1396,POKE1397,POKE1398,POKE1399,POKE1400,POKE1401,POKE1402,POKE1403,POKE1404,POKE1405,POKE1406,POKE1407,POKE1408,POKE1409,POKE1410,POKE1411,POKE1412,POKE1413,POKE1414,POKE1415,POKE1416,POKE1417,POKE1418,POKE1419,POKE1420,POKE1421,POKE1422,POKE1423,POKE1424,POKE1425,POKE1426,POKE1427,POKE1428,POKE1429,POKE1430,POKE1431,POKE1432,POKE1433,POKE1434,POKE1435,POKE1436,POKE1437,POKE1438,POKE1439,POKE1440,POKE1441,POKE1442,POKE1443,POKE1444,POKE1445,POKE1446,POKE1447,POKE1448,POKE1449,POKE1450,POKE1451,POKE1452,POKE1453,POKE1454,POKE1455,POKE1456,POKE1457,POKE1458,POKE1459,POKE1460,POKE1461,POKE1462,POKE1463,POKE1464,POKE1465,POKE1466,POKE1467,POKE1468,POKE1469,POKE1470,POKE1471,POKE1472,POKE1473,POKE1474,POKE1475,POKE1476,POKE1477,POKE1478,POKE1479,POKE1480,POKE1481,POKE1482,POKE1483,POKE1484,POKE1485,POKE1486,POKE1487,POKE1488,POKE1489,POKE1490,POKE1491,POKE1492,POKE1493,POKE1494,POKE1495,POKE1496,POKE1497,POKE1498,POKE1499,POKE1500,POKE1501,POKE1502,POKE1503,POKE1504,POKE1505,POKE1506,POKE1507,POKE1508,POKE1509,POKE1510,POKE1511,POKE1512,POKE1513,POKE1514,POKE1515,POKE1516,POKE1517,POKE1518,POKE1519,POKE1520,POKE1521,POKE1522,POKE1523,POKE1524,POKE1525,POKE1526,POKE1527,POKE1528,POKE1529,POKE1530,POKE1531,POKE1532,POKE1533,POKE1534,POKE1535,POKE1536,POKE1537,POKE1538,POKE1539,POKE1540,POKE1541,POKE1542,POKE1543,POKE1544,POKE1545,POKE1546,POKE1547,POKE1548,POKE1549,POKE1550,POKE1551,POKE1552,POKE1553,POKE1554,POKE1555,POKE1556,POKE1557,POKE1558,POKE1559,POKE1560,POKE1561,POKE1562,POKE1563,POKE1564,POKE1565,POKE1566,POKE1567,POKE1568,POKE1569,POKE1570,POKE1571,POKE1572,POKE1573,POKE1574,POKE1575,POKE1576,POKE1577,POKE1578,POKE1579,POKE1580,POKE1581,POKE1582,POKE1583,POKE1584,POKE1585,POKE1586,POKE1587,POKE1588,POKE1589,POKE1590,POKE1591,POKE1592,POKE1593,POKE1594,POKE1595,POKE1596,POKE1597,POKE1598,POKE1599,POKE1600,POKE1601,POKE1602,POKE1603,POKE1604,POKE1605,POKE1606,POKE1607,POKE1608,POKE1609,POKE1610,POKE1611,POKE1612,POKE1613,POKE1614,POKE1615,POKE1616,POKE1617,POKE1618,POKE1619,POKE1620,POKE1621,POKE1622,POKE1623,POKE1624,POKE1625,POKE1626,POKE1627,POKE1628,POKE1629,POKE1630,POKE1631,POKE1632,POKE1633,POKE1634,POKE1635,POKE1636,POKE1637,POKE1638,POKE1639,POKE1640,POKE1641,POKE1642,POKE1643,POKE1644,POKE1645,POKE1646,POKE1647,POKE1648,POKE1649,POKE1650,POKE1651,POKE1652,POKE1653,POKE1654,POKE1655,POKE1656,POKE1657,POKE1658,POKE1659,POKE1660,POKE1661,POKE1662,POKE1663,POKE1664,POKE1665,POKE1666,POKE1667,POKE1668,POKE1669,POKE1670,POKE1671,POKE1672,POKE1673,POKE1674,POKE1675,POKE1676,POKE1677,POKE1678,POKE1679,POKE1680,POKE1681,POKE1682,POKE1683,POKE1684,POKE1685,POKE1686,POKE1687,POKE1688,POKE1689,POKE1690,POKE1691,POKE1692,POKE1693,POKE1694,POKE1695,POKE1696,POKE1697,POKE1698,POKE1699,POKE1700,POKE1701,POKE1702,POKE1703,POKE1704,POKE1705,POKE1706,POKE1707,POKE1708,POKE1709,POKE1710,POKE1711,POKE1712,POKE1713,POKE1714,POKE1715,POKE1716,POKE1717,POKE1718,POKE1719,POKE1720,POKE1721,POKE1722,POKE1723,POKE1724,POKE1725,POKE1726,POKE1727,POKE1728,POKE1729,POKE1730,POKE1731,POKE1732,POKE1733,POKE1734,POKE1735,POKE1736,POKE1737,POKE1738,POKE1739,POKE1740,POKE1741,POKE1742,POKE1743,POKE1744,POKE1745,POKE1746,POKE1747,POKE1748,POKE1749,POKE1750,POKE1751,POKE1752,POKE1753,POKE1754,POKE1755,POKE1756,POKE1757,POKE1758,POKE1759,POKE1760,POKE1761,POKE1762,POKE1763,POKE1764,POKE1765,POKE1766,POKE1767,POKE1768,POKE1769,POKE1770,POKE1771,POKE1772,POKE1773,POKE1774,POKE1775,POKE1776,POKE1777,POKE1778,POKE1779,POKE1780,POKE1781,POKE1782,POKE1783,POKE1784,POKE1785,POKE1786,POKE1787,POKE1788,POKE1789,POKE1790,POKE1791,POKE1792,POKE1793,POKE1794,POKE1795,POKE1796,POKE1797,POKE1798,POKE1799,POKE1800,POKE1801,POKE1802,POKE1803,POKE1804,POKE1805,POKE1806,POKE1807,POKE1808,POKE1809,POKE1810,POKE1811,POKE1812,POKE1813,POKE1814,POKE1815,POKE1816,POKE1817,POKE1818,POKE1819,POKE1820,POKE1821,POKE1822,POKE1823,POKE1824,POKE1825,POKE1826,POKE1827,POKE1828,POKE1829,POKE1830,POKE1831,POKE1832,POKE1833,POKE1834,POKE1835,POKE183
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can be worth it though. One fairly obvious feature, if you have enough memory to spare, is to draw some hidden patterns, or even a personalized signature. This isn't difficult provided you've got the pointers to design the graphics. There are however a few simply implemented techniques which can add a bit of sparkle to what otherwise would be fairly boring instructions. For example, instead of simply PRINTing the instructions on the screen one page at a time, why not POKE them on later by later, with accompanying notes. A simple example is shown in Listing 3.



Screen 1, showing the technique shown in Listing 4, or if you want something more impressive, you could make each page of instructions disappear down a back hole, to be replaced by the next page. This is demonstrated in Listing 5, if that doesn't appeal, try Listing 6.

You can also make use of these locations in the main game: the ship explodes into fragments with such force that even the screen shakes!

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1 REM LISTING 3
2 REM BORED FOR YOU
3
4 SCREEN 0
5 POKE 56288,0
6 POKE 56289,0
7 POKE 56290,0
8 POKE 56291,0
9 POKE 56292,0
10 POKE 56293,0
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17 POKE 56300,0
18 POKE 56301,0
19 POKE 56302,0
20 POKE 56303,0
21 POKE 56304,0
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26 POKE 56309,0
27 POKE 56310,0
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machine, and the only bug you're likely to get is the one brought about by careless programming. The main problem arises when you modify and re-modify programs, and lose all semblance of structure. Even though your program must be squashed down as tightly as possible, it is essential to make sure that the overall structure is clear.

The first stage should be to get a working prototype of your final program. If possible, lay it out, and then re-write it from scratch, planning such sections carefully. It's not difficult at this stage because you should by now know exactly what you're going for. The main thing to avoid is not to jump out of loops or GOTOs. If you do, you'll get those annoying OUT OF MEMORY errors. If you have a rapid facility, make sure everything is properly structured at the start of the program, and if you are using arrays, make sure that they are a defined word (three or at least two) elements less than 10 elements. Otherwise the VIC will reserve space for 10 elements, and you'll be losing valuable memory.

Having re-written the program, you're probably find it much improved, and you might think that you're home and dry, not quite! You know how the program works, and you play the game accordingly. When about the person the game is intended for? If for example the game is intended for a young child, then in one corner of the program, it can be a horrendous experience! The last time the child will probably do a point to your amazing graphics which are making all over the screen. This will obviously result in an arm resting on the keyboard, touching the RUN/STOP key, and ending the game. OK, so perhaps, enable the RUN/STOP key, or even the whole keyboard.

modify the program, and eventually you'll get there. All you need is patience.

Memory expansion

Up to now I've dealt exclusively with the unexpanded VIC 20. All the techniques and programs described will work equally well on the VIC 20XS, but problems arise if you want to work with BASIC. This is because the memory map of the VIC 20 is altered with an expansion of 8K, and above, as shown in figure 4a for most arcade-type games you don't need expansion, and you're probably better off without it, as it forces tight programming. However, sometimes you do need the extra memory, and you will have to modify your programs accordingly. If you are not using LOGs, it is quite straightforward. All you have to do is remember that the screen character locations start at 4096, and the screen colour locations start at 8192.



If you are using LOGs you have to find somewhere to store them. With the unexpanded VIC20 we simply

deleted pointers. The way round the problem is to relocate the screen, as shown in figure 4b. This can be done either in direct mode, or more elegantly by using a short relocations program, such as the one shown in Listing 7. In the main program (Listing 6), all you have to do is set the character pointer to the start of projected memory, starting at 4096, and that's it. You now write the program as normal — even the screen character and colour locations are back in their usual position.



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1  REM LISTING 7
2
3
4
5  REM BK INITIALIZATION.
6
7
8  POKE43,1:POKE44,32:POKE8192,0
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10 POKE641,8:POKE642,32
11
12 POKE648,38:POKE36866,150
13
14 POKE36869,240
15
16 PRINT"OK"
17
18
19
20 REM AUTO LOAD
21
22
23 FORI=1TO7:REPOW:POKE630+I,H:NEXT
24 POKE192,7
25
26 DATAT6,111,13,82,85,78,13
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28 REM
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REWRITE THE HIGH SCORE TABLES

So, you've got a Commodore. You've also got enemies. With the Gunshot, you'll have all the opposition covering in corners. 8-directional action and an all-in-one moulded vertical joystick accurate annihilation and strength to survive those all-right versions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12-month guarantee will prove invaluable. Only \$8.95. The Gunshot plugs directly into the CBM 64 and Vic 20. Ask about Vulcan Interfaces for the C16 and Plus 4.

See the range of Vulcan joysticks and interfaces at your local stockist - we'll see you on the high score tables.



VULCAN
ELECTRONICS LTD
Joystick Geniuses

**Have you experienced
the frustration of
losing a program? S.
Robinson offers a new
solution to an old
problem.**

HOW DO YOU RECOVER A crashed BASIC program? Maybe perhaps the computer is Locked Up. You may even have accidentally used NEW. The first problem therefore is how to REBOOT your locked up computer. With both the Commodore and the VIC20 not having a reset key, you have to stop it in a different way.

Resetting

Referring to page 143 of the User Manual or page 161 of the Reference Guide for the Commodore VIC20 owners refer to page 281 of Reference Guide will show details of the User Port. It states grounding pin 3 will do a soft start, but normally will not be used by manufacturers, connecting the reset pin 1 to the ground pin 1 with a piece of wire your computer does a softstart. The Reset Port has a reset pin and can be used in the same way.

How BASIC is stored in memory

Having recovered control of your computer you must next consider how BASIC program is stored in memory.

Enter the following line in direct mode after first switching off and then on again:

```
CBM64:
FOR I = 2648 TO 2661 : PRINT PEEK (I) : NEXT
VIC20:
FOR I = 4096 TO 4126 : PRINT PEEK (I) : NEXT
```

You will get on the 64:

```
0 0 0 66 0 146 0 152 0 0 255 255
255 255 255 255 255 255 255 255 255 255
255 255 255 255 255 255 255 255 0
```

On the VIC20:

```
0 0 0 66 0 146 0 152 0 0 234 41
74 158 etc
```



OLD FOR NEW

The saved BASIC program, starts at 2648 on the Commodore and 4096 on the VIC20. Data within the following saved BASIC program:

```
0 ....
1 PRINT "QUALITY"
2 GOTO 1
```

is stored at address locations. Repeat the direct mode entry from above i.e. FOR I=2648 TO 2661 on the 64 or FOR I=4096 TO 4126 on the VIC20. Now memory contents are:

```
0 0 0 66 0 146 0 152 0 0 255 255
255 255 255 255 255 255 255 255 255 255
255 255 255 255 255 255 255 255 0
```

CBM64
0 11 0 0 0 146 146 146 146 0 25
0 1 0 152 66 67 67 66 66 66 34

VIC20
0 11 16 0 0 146 146 146 146 0 25
10 1 0 152 34 67 67 66 66 66 34
0 12 16 2 0 152 49 0 0 0

The contents of address 2648 & 2649 i.e. 11 & 0 are the link address pointing to the beginning of the second line in BASIC i.e. 2659-2660-2661. The contents of address 2659 & 2660 store the first line i.e. 0. Similarly the contents of 4097 & 4098 are the link address pointers on the VIC20.

Now perform a reset or NEW on VIC20 and memory becomes:

CBM64
0 0 0 66 0 146 0 152 0 0 0 25
0 1 0 152 66 67 67 66 66 66 34

VIC20
0 0 0 66 0 146 0 152 0 0 0 0

These data items in bold are the only changes in regard of memory.



[illegible]

1000

Your

Submissions

COMMODORE

YOUR BEST INDEPENDENT COMMODORE MAGAZINE

SO YOU OWN A COMMODORE?

SO YOU'VE WRITTEN SOME PROGRAMS?

SO WHY HAVEN'T YOU SUBMITTED THEM TO US?

Your *Commodore* is always on the lookout for new material for publication and we know that there are thousands of intelligent, literate, innovative and creative Commodore owners out there, so why don't we get together?

If you have written an exhilarating game or an invaluable utility on your Commodore micro, share your talents with us and our readers by submitting your efforts and the form to the address below. All articles should be documented and type-written and should be accompanied by a printout of the program as well as a copy of the program on cassette or disk. A 1 material should be original; if it is not chosen for

publication, it will be returned to you.

You may not have written any software yourself, but you have very firm opinions about the world of Commodore and all their attendant industries and products. Then put your opinions on paper and post them to us, again at the address below — you never know, you might even get paid for airing your views! All submissions should be sent to:

The Editor

Your Commodore
Argus Specialist Publications Limited
No 1 Golden Square
London W1R 3AG



PLEASE COMPLETE IN BLOCK CAPITALS

Your Name _____

Program Name _____

Computer/memory size it runs on _____

Amount of memory program occupies _____

Other computers/mainframes that affect your program
Run or without connection or use _____

Does your game need or not need color? ☐ Yes ☐ No

Have you sent your game to another magazine? ☐ Yes ☐ No

Is Program not a variation on a theme? _____

Your Address _____

Telephone Number _____

Terms to contact you: _____



VIZASTAR 64

THE INFORMATION PROCESSOR

■ Spreadsheet

■ Database

■ Graphics

- Fast access to your information files and include them on the one diskette for fast, portable, unattended even simplified

- Instant, on-screen design of your information records

- Flexible retrieval system that lets records without being permanently stored in your information records

- Records up to 1,000 characters long and includes up to 255 characters

- Supports terminals via points COM, EPPROM, RS, RS232C, UART and more others
- Flexible printer interface, it is user-modifiable

- One word menu, flexible menu selection of functions
- The high resolution graphics format for worksheet giving an easy-to-read display

- 4, 1600 Row by 64 Columns wide worksheet with large memory capacity and efficient storage
- Extensive use of 31 column tables, you can use any part of the information without restriction

- Integrated spreadsheet features include individually resizable columns, multiple protected cells, 1000 spreadsheet facility plus a wide range of matrix functions

- The robust manipulation lets you Search, Sort, Copy, Move, Delete and Insert by row, column or a range

- Text editing facilities like Insert, Amend, repeat, delete etc.

- Include information directly into the Worksheet from VisiStar and other app. other system
- Spreadsheet displays of work sheet and linear bar graphs

VisaStar integrates three important electronic aids to your business or home-office.

A fast and easy-to-use package - VisaStar is a comprehensive information processor that includes an electronic worksheet, information filing system and simultaneous on-screen graphics.

VisaStar has been designed to incorporate the very latest in user-friendliness - so now you can handle your all-important information in many new ways and in a quick and effective manner.

The information filing capabilities of VisaStar enable you to store your information onto disk in

an ordered and instantly retrievable form. This means that you can quickly pick out individual or entire groups of related information to create lists, statements, labels or reports.

VisaStar is the ONLY program of its kind on the Commodore 64. Completely consistent with the VisaWrite word processor, VisaStar provides a totally comprehensive office system.

VisaStar costs just £99.95 (incl. VAT) from your computer dealer and selected stores. Please write for more details and the name and address of your nearest dealer.



SOFTWARE

VIZA SOFTWARE, 9 MANSION ROW,
BROMPTON, GILLINGHAM, KENT ME7 5SE
TEL: MIDWAY (0634) 813780

Dealer enquiries welcome

AVAILABLE NOW - VIZASTAR 64
£99.95
(inc VAT)



**An epic space
adventure from Mike
Roberts in which the
safety of earth itself is
at stake!**

GREEN THINGS FROM OUTER SPACE is a game of exploration and survival involving things — *guyz* if you dare!

Green Things From Outer Space runs on a C64 and will run on a Plus/4 with no modifications at all.

The object of the game is to save the green things, getting to the bottom of the screen. There are two green things on the screen at any one time and your last hope is at the bottom. The screen is 24 shades of blue going from dark at the top over space to a light blue at the bottom. Your ship moves left and right by the J and K keys, the scan line is fixed by the I key.

The program contains 8,192s in real mode to increase speed and reduce memory consumption. There are no commands to access these, in the very comprehensive BASIC that the C64 and Plus/4 comes with, so I have had to use FOR...NEXT. Doing this on a C64 is very awkward as you have to code after the memory banking and set pointers and the area of memory. After programming and understanding what I am doing, everyone else will have to wait until the techniques become better known.

If you look out of the program, or obtain an error the screen may collapse as you will know what it is, what it happens if you want to get back to normal press stop/reset and X is normal.

All other instructions are contained in the program.

GREEN THINGS FROM OUTER SPACE

Program Listing

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100 REM ***
101 SCREEN 0
102 COLOR 1,0:INKEY$=IN$(KEYBOARD):IF INKEY$=""GOTO 100
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Program Listing (cont.)

```

500 COLOR0;2,0:COLOR4;3,0:PRINT"";PRESS RETURN-THREE TIMES"
510 FORI=1TO3
520 DOLOOP UNTIL PEEK(199)=1
530 DOLOOP UNTIL PEEK(199)=1
540 PRINTI+1
550 PLOT(COLOR0;2,0:COLOR0;3,0:COLOR4;3,0
560 PRINT"";DOUNT 0000 0000 0000"
570 PRINT"";PRINT"";DOUNT
580 PLOT0
590 COLOR0;2,0:RETURN
600 PRINT"";THE VILE GREEN THINGS FROM OUTER SPACE";COLOR0;2,0:PRINT""
610 PRINT"";ON THIS GAME OF SKILL AND STRATEGY THE"
620 PRINT"";PLAYER MUST BLAST TO BITS ALL OF THE"
630 PRINT"";VILE GREEN ALIENS THAT ARE OUT TO GET"
640 PRINT"";OUR OLD MOTHER EARTH."
650 PRINT"";THIS GAME CONCEPT IS TOTALLY ORIGINAL"
660 PRINT"";WHO WOULD THINK OF A GAME WHERE YOU"
670 PRINT"";HAVE TO SHOOT GREEN ALIENS?"
680 PRINT"";BUT IF ANY OTHER BEING HAS"
690 PRINT"";SUCH A GAME WHERE YOU HAVE TO BLAST"
700 PRINT"";ALIENS OUT OF THE SKY PLEASE LET US KNOW!"
710 PRINT"";PRESS [ ] TO CONTINUE";COLOR0;3,0:PRINT"";TO CONTINUE";COL
OR0;3,0
720 DOLOOP UNTIL PEEK(199)=1
730 GET#
740 PRINT"";THE VILE GREEN THINGS FROM OUTER SPACE";COLOR0;3,0:PRINT""
750 PRINT"";YOU ARE THE LASER BASE AT THE BOTTOM OF THE SCREEN."
760 PRINT"";THE VILE GREEN ALIENS ARE THE ALIENS"
770 PRINT"";BUT ARE A VILE GREEN COLOUR."
780 PRINT"";TO MOVE YOUR LASER BASE (WHICH IS ALSO"
790 PRINT"";EXACTLY GREEN COLOUR) YOU USE THESE"
800 PRINT"";YES"
810 PRINT"";= LEFT"
820 PRINT"";= RIGHT"
830 PRINT"";= ANIMATE THE VILE GREEN ALIENS"
840 PRINT"";IF THEY GET TO THE BOTTOM THEN IT'S"
850 PRINT"";HARD CHEESE AND YOU DIE IN GREAT AGONY"
860 PRINT"";KILL LOTS OF THEM AND YOU GET POINTS";RETURN
870 DOUNT=0:FORI=1TO4:IF PEEK(199)=1:PRINT"";NEXT
880 DOUNT=0:RETURN
890 DOUNT=0
900 DOUNT=0:PRINT"";PRESS [ ] FOR 0:0000:FORI=1TO4:IF PEEK(199)=1:
910 FORJ=1TO4:PRINT"";NEXT
920 DOUNT=0:PRINT"";NEXT
930 COLOR0;2,0:COLOR4;3,0:COLOR0;1:END
940 DOUNT=0:COLOR0;3,0:COLOR0;2,0
950 PRINT"";YOU HAVE IT";PRINT"";
960 PRINT"";BET AGAIN THE FORTH IS BART FROM THE"
970 PRINT"";ALIEN FENCE."
980 PRINT"";PRESS ANY KEY FOR ANOTHER GAME"
990 DOFORI=1TO4:COLOR4;3,0:PRINT""
1000 GET#
1010 GET#
1020 GET#

```

READY.



Have you got the nerve and courage to attack the aliens in this great arcade game from F.G. Tout. The race for space is on.



Four Mission: To invade the friendly system.

The Enemy: There are four waves of alien forces trying to prevent you from completing your mission. Each alien destroyed scores 100 points.

WARNING: Try not to waste missiles or you will not have the ammunition to fire when you want to.

Four Forward: Should you complete the mission you will receive 2000 points and an extra space ship.

You do not have to accept this mission but if you decide to, all the information you need is listed below.

Good luck.

SCRAMBLE



Variables

A1 — 50 H Sound
V Sprites Var 00048
L0's A0, A1, G1 A0's Address
for Sprites — 10 score — 10 level
R0's joystick

Program Information Part 1

5	— 200	Download U.D.Co
300	— 430	Letters
1000	—	Sprite data

Program Information Part 2

4	— 200	Instructions
19999	— 20000	A0/C joystick routine
30000	— 30009	Yet more sprite data
50000	— 50010	M/C scroll screen
50040	— 60000	M/C ROMmed.....

Program Information Part 3

5	— 99	Var's
1000	— 1099	Screen 1
2000	— 2170	Screen 2
3000	— 3170	Screen 3
4000	— 4170	Screen 4
5000	— 5035	Main Routine
5100	— 5270	Check Collisions
11000	— 12070	Hrt Sound
13000	— 13020	Pat to next wave
20000	— 20070	Sprite positions
30000	— 30020	Game Over Routine
31000	— 31035	The End!!!!.....
40000	— 40775	Check Score
60000	— 60150	Title Page.....
62000	— 62799	Musical Intro!
63000	— 63860	Key Ref





Preparation of the Laboratory Environment

[illegible]

February 2009 31

[illegible]



Programas em 3 idiomas

姓名: 王明
 性别: 男
 出生日期: 1990年1月1日
 身份证号: 110101199001010001
 联系电话: 13800138000
 电子邮箱: wangming@example.com
 联系地址: 北京市朝阳区三里屯
 邮政编码: 100000
 职业: 程序员
 教育背景: 清华大学计算机系本科毕业
 工作经历: 曾在互联网公司从事软件开发工作5年
 兴趣爱好: 阅读、跑步、看电影
 自我评价: 性格开朗，工作认真负责，善于团队合作

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£6.95

CASTLE GREYSKULL

48K SPECTRUM

£5.95

SALES MANAGER
T.C. SAPHIER

SOFTWARE MANAGER
C.A. SAPHIER

NOTE WE HAVE MOVED TO NEW PREMISES

C

Test your powers
against the computer
in S. Davis'
computerized version
of noughts and
crosses for the
Commodore 64 or
VIC 20.



NOUGHTS AND CROSSES has appeared to people of all ages for many years. Here you can test your wit against your computerized foe, because computerized never make mistakes.

It's a program where there's more of play. On the board

level (beginner), the computer makes a logical move 98% of the time. Level 2 (Amateur) makes the computer play logically 95% of the time. And, to prove that you don't get too frustrated, once a computer will play logically only 85% of the time on level 3 (Expert) that

you play at this level on your friend's computer!

Type in the program exactly as designed to play on any VIC 20 (with or without minimum experience) or a C64 64.

The game itself is like you go to school, but instead of

play and whether you wish to play first. From then on, you and the computer will take it as turns to go first. The last player is a ways "X" and, while the computer is making its move its thoughts are if you win. A more fully, it is designed to be one of many, many

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400-410 If no out is seen the column is 7 (no out is 700 7000 out 7
410 700 700 700) and 4000 is a VIC 20/64. Increase screen,
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Program Listing

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Runecaster is shrouded in mystery this month.

IN THE PAST TWO MONTHS WE HAVE dealt with mugging and mazes; this month it is the turn of the third 'in'—enigmas. A mystery is a puzzle, and that for rather a series of these is what adventure games are all about.

In some ways a good adventure game is rather like the 'Daily Telegraph crossword'—the answer is often staring you in the face as the time—you just (if) have to read the question correctly and then manipulate linked words, objects or areas until they make sense!

Of course the object of the author/programmer is to make these puzzles fairly devious...I say and mean 'fairly devious'. Anyone can draw up a set of puzzles that are almost impossible to solve, but a good adventure is like a good book—it has got to keep up a certain 'pace' or it fails. Some programs are a failure for this very reason. The player is not given a chance to get the feel of the game but is thrown straight into a situation that would tax the patience of a saint!

Many people have 'cut their teeth' on adventures, such as the *Enchanted Adventure* by Level Five. Although these provide two different types of quest, they both use the player a fair bit of rope when starting. You do come up to be solved but if you are, you learn something as the process. In both of these programs there are also alternative paths to be taken which you are 'learning the ropes' you don't have these steps and also, inevitably!

First steps

Learning the ropes—what does this mean? what do you look for, how do you get past the dragon, board the boat—or whatever? First of all, look carefully at any instructions, sometimes there can be lengthy and you will not be able to assimilate all that they have to say, but read them anyway. Next, something that happens (or doesn't) may trigger off a vague memory, so plough your way right through them all. In particular look for any commands that they list—INVENTORY, LEAVE, LOOK, HELP etc.

As you move around (puzzling your progress of course!) take very careful note of what the location description is to you and what you find lying around. It will all add and later some lines by a note—perhaps you could chop one down to make a bridge.

OF COURSE, everything you can, some programs only permit this if you are inside holding the object, others are more to want it is a—too easy to assume that a simple description implies an



obscureness—which you never seem able to find!

Perhaps that ace you found might yield to examination? "very blunt, the sword comes off in your hand"—have you already spotted a use for a short length of wood? Examine the tree and you might find a rope you could climb. Some programs (however you don't wish a short description of everything examined but perceive and don't list it) put you still looking at everything so carefully as possible.

Indeed, clearly as you can, how many items you can pick up and retain at any time. Usually you look out for anything that may enable you to carry items there—a rock or a string with a knot! Certain objects could very well be wrong, in fact some are so, probably have to be used to enable you to complete the adventure. 'Your glasses' might give you quite a different view of things! Missing something may also allow you to carry more—check it!

Many adventures are divided into sections, each with their own set of puzzles to solve, before you can progress to further sections. More important, objects from previous sections are almost certainly going to be needed to solve future puzzles.

Section jumping

This brings us to one of the most common 'game' found in many forms in lots of adventures—'section jumping'. This is where you are forced to start the section with a puzzle or puzzle answered, because a clue or object needed is in another section. More often than not, the solution to the original puzzle is needed to move on from the next section!

Look out for objects that may be combined with other objects for be shared in some way to produce a different but useful article. The more obvious example here is a reed, bottle or

balms that may be used later to carry water etc. How about a glass object that could be broken and provide a small cutting tool (break it)? Items or that strange lamp of metal may be transformed into hammers or axes.

Can you buy or find your way out of trouble? Does the northwardly supporting word GIVE. Note also that usable items are not always listed separately, sometimes they are within the location's description and sometimes they just appear in the program!

Many puzzles are a play on words or on the theme of associated ideas—careless jumps of jelly might prefer to eat the rot you just passed, waterable you! An odd map very well—writing gives a pair of temples...on a bright sunny day. The possibilities go on and on, but it all comes back to a careful examination and appreciation of everything you find!

Playing safe

As said before in these articles about your position regularly—you don't know what is going to happen just around the corner! Try to keep one set of skills that represent a 'clean' gain through the adventure. By all means explore everything you come to, but with you that, you know how to take a particular section: start from your last 'save' and complete the latest part with its mistakes and no more moves—you must future may depend upon a light saving on or food lasting for only a certain number of moves. It's almost certain that number will not allow for your bungling around (mazes or generally exploring)!

If the facility exists, check your SCORE! Many allow. Although this is no certain thing it might give you a clue to whether an item just picked up is going to be useful later.

If the mathematics are not a fear, find out what sort of words, any and grammar the program recognises. Many games use a verb followed by a noun, GO NEST, or



CLIMB TREE, BURN: PAROQUET and some will allow or occasionally need an adjective: ROSE YELLOW BURN, CAI LANCIA, etc.

As games become more complex, major sentences are becoming acceptable GO NORTH QUINCY, may be necessary to ensure that you are not discovered. This can put a more interesting program, but the trend could easily become — what was a logical and stimulating puzzle becomes a protracted test of weight and more overstatements.

Even with the obvious limitations there is a lot to be said for the limited range of verbs and noun options in the order. An adventure game written in the language does not become a typing competition, and you are less likely to miss the flow of ideas which helps to drive an long adventure game along!

Check how much of a word the program actually needs — do you really have to type in FLASCAT, FALSBED, or until FLAD? (After all, I know a *FL* seems wrong but again, it's quicker and a hint you're concerned on playing the game correctly.)

I imply the vocabulary word. As the last before it is composed for a program to recognize every word and run, each type is — there is a list not always entirely available. I feel that programmers, instead, seek to fairly compare good words such as "big" and not "small" or "bigger" but all the more, each of the last a different "common use vocabulary" and you sometimes about questions and find you might not for their word — how a language, but is rather like a dictionary about you to guess other words meaning the same thing, most of the meaning and derivation of a word (probably the simplest to use is The New Century Thesaurus and add "to" for English understood).

[That] put almost every last 'weight
adjusters' gear' among the three 'in's' I
possessed and other areas brought to light
— you know that additional

Thyroid, the thyroid gland, thyroiditis

Several months ago we purchased our adventures in the pipeline from Nicotek Publishing, we now have some of these up and running on our Comstockers list.

The *Manhattan Steel Roll* saves the world, is based loosely upon Harry Morgan's well-known science-fiction book of the same name — the book, published by *Hyphen Books*, is available with this magazine.

Loading the program takes about 30 minutes and price loaded some difficulties was encountered in not having the slightest idea of what to do, you are shipped (are do Grid), a super deal comes out. Your attraction is well supported (first-

lonely and also somewhat super-drool the missing — you fear the worst and run over to Professor Coppel's laboratory, only to find him just disappearing into a time helix. Perhaps, Angela just been abducted via such a time. What now, after some time in jail, from somewhere. The same old story.

Do you want to try again to meet the world? That is your privilege after the 14 days and the time, measured, "You the owner here - anything! GO! HELL!" you are in a familiar looking bar with long hair, long fingers, a lot of hair on back of head, one little hole, eyes.

As the word is whispered into your ear, you'll want to tell about your partner, your sex, your position, and your attitude. **STATION 1**—one is Coppy's, one is just a CD-R. He does have to examine one of these—our math teacher, my CAT Scan time of them, see that can be done.

How big, how loud? **OLD NORTH** This is where you witness that you are dealing with a different type of advertising game from normal...the response rate — **THE ANSWER CRACK**...where, how?

Look more carefully at the screen — work graphs picture on the top 2 even lines, then a single line window for the description, finally a five line window for your command(s) and some immediate answers, like TRY AND THIS OBJECT

How much to learn from the program, the students have been picked up but they are 'stuck' on the lab's, to read the instructions again. Most of the students had a hard time, even though they had a good background in the field, they had a hard time to read the instructions. They had a hard time to read the instructions.

— I do like that app more in the boardroom. It's like a reminder — well at least that's what I thought. But a page — level editor, it was great and finally a short report that about the time I had finished. "yes, the, remember and please. You will have your own report and then you will have your own report." — well, then, you

Typing "H" for HELP doesn't seem to be a great success; at the point, it always prints up SCHEME followed by a report of the location identifier, printed on a line in which takes about 10 seconds to get to the end of the second line to put a title line in parentheses, and might

Handcuffs? Now I've heard two secrets I've seen all your clever dogs need a reward not just more than, having got Coppo's master should have been BULLDOG — know it all this time, didn't you — Clever!

Having lived my teen years with hormones — love and passion are my middle name GARDNER, SCHUL, EAST or WEST for me — you deal in SPIN, FLUX, PHASE and DISORDERS and I can go anywhere, anytime. The only trouble is I haven't yet got the hang of what atom which, when or where. Some combinations give me a chunky attractive to cure and some a

collect a description and the display of my
name, being possible.

The idea behind the program is meant to give the user, about 15 minutes, whatever it takes to be a mathematical genius, an avid adventurer—what does every one in that there may be another crater like 88,925 6448—waiting for me to use it. The whole operation is done in a matter of seconds and I don't really know what I'm doing, that isn't as big a thing as it may be. Later.

I've already been instrumental in a delicious 1994 Turner Group built-for-TV series producer's campaign, the latter and awarded an Emmy. But, without some more obvious credits look to all the time-space burning, I think I'm going to loose interest soon — perhaps because I'll produce a help sheet — BUDGET, IT'S FREE!

Three Senses and More (Page 40) Image

After my time-space adventures with the flat, it was a pleasure to slip quietly into just one time and space based on Harry Potter's book.

His return to his village, so kind the
 his family has been kidnapped. Now
 mission, would you wish to accept it? It
 to occur there from their lips. You think
 you know they were taken away by sea—
 as if a great urgent necessity must be to
 ready, your heart and crown for a rough sea
 and—

High-resolution pictures are drawn in a linear row half of the screen display. In bottom-third mode, icons are used for descriptions, actions and commands. Pictures are a little slow to complete—about 20 seconds for graphics-display plus location description—but the screen screens are good and if you are in a hurry you may switch them off and back on if you wish.

Objects to find and use are plentiful and the puzzles provided are logical and entertaining. Although I have not yet completed the adventure, there is a good feeling to it and I am sure that it will prove a good introduction to adventuring for many.

Slapping is of course essential and the necessary terms, in the case of readability, a list of useful verbs is provided in the 20-page instruction/history. Because less interesting words are commented. You may GET and DROPPED IN THE MIDDLE and a few other. To repeat a previous command, the same may be used on objects you do not have. But can you and SALT and HISTORY of a game position is supported. Would you, get really stuck, a Turn sheet is available from www.bowserpublishing.com.

And it's a more enjoyable game even a little slower — no patterns and the compressed 1-1000 takes about 4 seconds to display 17,000s of destruction. Good plot, good graphics when you want them — say it.

Instructions are the subject of this month's installment of A.P. and D.J. Stephens' informative machine code series.

Assemblers, in general, require adding, subtracting, multiplying, dividing and so on to get a final answer to a given problem. Some of these operations are available in BASIC, very convenient queries which answer by the user, call up a complete machine code reference manual with the Incorporated ROM. The users are facing those who are more independent and not content to rely on such option features — and that means us — a lesson. We can increment the B register, using `INC B` or `INC` and decrement them, using `DEC` or `DEC`. We can also increment or decrement the contents of any memory location by using `INC` or `DEC` respectively. Although these instructions are useful, they are not more than trade-counting operations.

The RNA microarrays often only tag part of the transcripts. AIC, which means "Add with Clarity and Significance" (where "Add" has Clarity), because of the inherent basic component structure, they can add an arbitrary nature of positive and negative numbers. For example, AIC can be +10 or -2, or 0, or 10, or 20, or 30, or 40, or 50, or 60, or 70, or 80, or 90, or 100, or 110, or 120, or 130, or 140, or 150, or 160, or 170, or 180, or 190, or 200, or 210, or 220, or 230, or 240, or 250, or 260, or 270, or 280, or 290, or 300, or 310, or 320, or 330, or 340, or 350, or 360, or 370, or 380, or 390, or 400, or 410, or 420, or 430, or 440, or 450, or 460, or 470, or 480, or 490, or 500, or 510, or 520, or 530, or 540, or 550, or 560, or 570, or 580, or 590, or 600, or 610, or 620, or 630, or 640, or 650, or 660, or 670, or 680, or 690, or 700, or 710, or 720, or 730, or 740, or 750, or 760, or 770, or 780, or 790, or 800, or 810, or 820, or 830, or 840, or 850, or 860, or 870, or 880, or 890, or 900, or 910, or 920, or 930, or 940, or 950, or 960, or 970, or 980, or 990, or 1000, or 1010, or 1020, or 1030, or 1040, or 1050, or 1060, or 1070, or 1080, or 1090, or 1100, or 1110, or 1120, or 1130, or 1140, or 1150, or 1160, or 1170, or 1180, or 1190, or 1200, or 1210, or 1220, or 1230, or 1240, or 1250, or 1260, or 1270, or 1280, or 1290, or 1300, or 1310, or 1320, or 1330, or 1340, or 1350, or 1360, or 1370, or 1380, or 1390, or 1400, or 1410, or 1420, or 1430, or 1440, or 1450, or 1460, or 1470, or 1480, or 1490, or 1500, or 1510, or 1520, or 1530, or 1540, or 1550, or 1560, or 1570, or 1580, or 1590, or 1600, or 1610, or 1620, or 1630, or 1640, or 1650, or 1660, or 1670, or 1680, or 1690, or 1700, or 1710, or 1720, or 1730, or 1740, or 1750, or 1760, or 1770, or 1780, or 1790, or 1800, or 1810, or 1820, or 1830, or 1840, or 1850, or 1860, or 1870, or 1880, or 1890, or 1900, or 1910, or 1920, or 1930, or 1940, or 1950, or 1960, or 1970, or 1980, or 1990, or 2000, or 2010, or 2020, or 2030, or 2040, or 2050, or 2060, or 2070, or 2080, or 2090, or 2100, or 2110, or 2120, or 2130, or 2140, or 2150, or 2160, or 2170, or 2180, or 2190, or 2200, or 2210, or 2220, or 2230, or 2240, or 2250, or 2260, or 2270, or 2280, or 2290, or 2300, or 2310, or 2320, or 2330, or 2340, or 2350, or 2360, or 2370, or 2380, or 2390, or 2400, or 2410, or 2420, or 2430, or 2440, or 2450, or 2460, or 2470, or 2480, or 2490, or 2500, or 2510, or 2520, or 2530, or 2540, or 2550, or 2560, or 2570, or 2580, or 2590, or 2600, or 2610, or 2620, or 2630, or 2640, or 2650, or 2660, or 2670, or 2680, or 2690, or 2700, or 2710, or 2720, or 2730, or 2740, or 2750, or 2760, or 2770, or 2780, or 2790, or 2800, or 2810, or 2820, or 2830, or 2840, or 2850, or 2860, or 2870, or 2880, or 2890, or 2900, or 2910, or 2920, or 2930, or 2940, or 2950, or 2960, or 2970, or 2980, or 2990, or 3000, or 3010, or 3020, or 3030, or 3040, or 3050, or 3060, or 3070, or 3080, or 3090, or 3100, or 3110, or 3120, or 3130, or 3140, or 3150, or 3160, or 3170, or 3180, or 3190, or 3200, or 3210, or 3220, or 3230, or 3240, or 3250, or 3260, or 3270, or 3280, or 3290, or 3300, or 3310, or 3320, or 3330, or 3340, or 3350, or 3360, or 3370, or 3380, or 3390, or 3400, or 3410, or 3420, or 3430, or 3440, or 3450, or 3460, or 3470, or 3480, or 3490, or 3500, or 3510, or 3520, or 3530, or 3540, or 3550, or 3560, or 3570, or 3580, or 3590, or 3600, or 3610, or 3620, or 3630, or 3640, or 3650, or 3660, or 3670, or 3680, or 3690, or 3700, or 3710, or 3720, or 3730, or 3740, or 3750, or 3760, or 3770, or 3780, or 3790, or 3800, or 3810, or 3820, or 3830, or 3840, or 3850, or 3860, or 3870, or 3880, or 3890, or 3900, or 3910, or 3920, or 3930, or 3940, or 3950, or 3960, or 3970, or 3980, or 3990, or 4000, or 4010, or 4020, or 4030, or 4040, or 4050, or 4060, or 4070, or 4080, or 4090, or 4100, or 4110, or 4120, or 4130, or 4140, or 4150, or 4160, or 4170, or 4180, or 4190, or 4200, or 4210, or 4220, or 4230, or 4240, or 4250, or 4260, or 4270, or 4280, or 4290, or 4300, or 4310, or 4320, or 4330, or 4340, or 4350, or 4360, or 4370, or 4380, or 4390, or 4400, or 4410, or 4420, or 4430, or 4440, or 4450, or 4460, or 4470, or 4480, or 4490, or 4500, or 4510, or 4520, or 4530, or 4540, or 4550, or 4560, or 4570, or 4580, or 4590, or 4600, or 4610, or 4620, or 4630, or 4640, or 4650, or 4660, or 4670, or 4680, or 4690, or 4700, or 4710, or 4720, or 4730, or 4740, or 4750, or 4760, or 4770, or 4780, or 4790, or 4800, or 4810, or 4820, or 4830, or 4840, or 4850, or 4860, or 4870, or 4880, or 4890, or 4900, or 4910, or 4920, or 4930, or 4940, or 4950, or 4960, or 4970, or 4980, or 4990, or 5000, or 5010, or 5020, or 5030, or 5040, or 5050, or 5060, or 5070, or 5080, or 5090, or 5100, or 5110, or 5120, or 5130, or 5140, or 5150, or 5160, or 5170, or 5180, or 5190, or 5200, or 5210, or 5220, or 5230, or 5240, or 5250, or 5260, or 5270, or 5280, or 5290, or 5300, or 5310, or 5320, or 5330, or 5340, or 5350, or 5360, or 5370, or 5380, or 5390, or 5400, or 5410, or 5420, or 5430, or 5440, or 5450, or 5460, or 5470, or 5480, or 5490, or 5500, or 5510, or 5520, or 5530, or 5540, or 5550, or 5560, or 5570, or 5580, or 5590, or 5600, or 5610, or 5620, or 5630, or 5640, or 5650, or 5660, or 5670, or 5680, or 5690, or 5700, or 5710, or 5720, or 5730, or 5740, or 5750, or 5760, or 5770, or 5780, or 5790, or 5800, or 5810, or 5820, or 5830, or 5840, or 5850, or 5860, or 5870, or 5880, or 5890, or 5900,

to one of hundreds. Long after completion, the largest possible space is 6,000 ft² and the largest single room is 1,000 ft². The building is 700 ft long, 300 ft wide and 10 ft high.

There, the workers put any additional steel and reinforced these loads. At the same time, construction is discontinued, the arena is vacated, and the steel is cut.

It is very difficult to guard the public from a building that is so close to the street and the arena, and the workers had to lead over two or three temporary locations. By employing a little ingenuity and craft, engineers have safely built up the catwalks to the stadium, the largest arena around the stadium, and the catwalks to the stadium.

Adding two numbers together

For more information, visit www.abc.com

ADD: Add the number, as defined by the operand, to the existing contents of the Accumulator, leaving no consideration for the state of the carry bit.

Expressing this as a periodic form, $A = A_0 \sin(\omega t)$, where A_0 is the number defined by the operator and ω is the carrier. The variation on the radio

the π is what happens and the left hand tells you what the result is left. This method of engineering the π is not all a mathematical and not an applied operational symbolism. Points that come out of the narrative (represented by π) is the above is a narrative came from a memory location, the person defined by the operator implies that, that there is no doubt that the occurrence is the person drama — it is the only way in the drama, which is equipped to handle and direct the contractors. It is recognized by the and is valid in the 2 or 3 regions. Further will you have any system in thing to do together two members in memory locations without involving the accumulator as an intermediate. In fact, this is a good problem to illustrate the

Assume one number is in address `%R0` and the other in `%R1` and we wish to add them up and store the result in `%R2`:

1000

UPA MC200
ONE
AGE MC200

1000

10/15/01	10/15/01
10/15/01	10/15/01
10/15/01	10/15/01
10/15/01	10/15/01
10/15/01	10/15/01

The first method is convenient as it does not limit the accuracy of a 32-bit floating-point number of any previous generation, but it does require a 64-bit floating-point Accumulator to store the value. The second method is more efficient as it allows the use of a 32-bit floating-point Accumulator with round-off addressing. Inexpensive, the 68000 has no instructions to directly store the Accumulator, or indirect addressing, to a 64-bit floating-point value. In both methods, with some limited exceptions, a better addresser (i.e., when a number of addresses have to be examined) is the result of a loop.

While the case of the C-200 is always lurking in the background, and may have been left in the C-1 case by a previous modification, it is essential that it be allowed to cure, by use of C.C. before making an addition from scratch. We should mention that there will be times, such as in multiple processes, with increased load when the C-

let is required but in some cases, CLC must be used immediately before the use of an ADC instruction. A significant percentage of bugs in a machine-code program are caused by the inclusion of the C-bit for which the programmer had forgotten to allow.

Overflow status

If, after an arithmetic instruction, the micro-processor senses that the result in the Accumulator will be outside the limits of +127 or -128 it will set the V-bit so that in the status register in other words, the machine will 'warn' the programmer that the last result caused overflow status; in other words, the result is 'other rubbish'. Should the programmer be concerned about that? Well, it's a bit strange, the answer is — probably not but depends on the interpretation the programmer places on the result. If he/she interprets the 8-bit result as a signed integer, within the normal range of +127 and -128, overflow status is serious and depends on whether in the program to initiate alternative action if it occurs. This can easily be done by using a BVS or BVC conditional branch (but, if the programmer is only concerned with absolute (not signed) numbers, overflow status can be safely ignored because the largest number in an 8-bit register is 1111 1111 (255 decimal). The only minor problem is that of the result, magnitude rather than as a sign bit.

Carry status

You have seen that, at times, overflow status can be ignored when working with positive absolute numbers but, the question which naturally follows is, 'What happens if the result is over 255?' Then, where the C-bit comes in. Although the C-bit occupies a strange position in the status register, it can be treated as the 'ninth' bit of the Accumulator. Also, since bits can accommodate numbers up to 511 decimal (0111 1111 binary) so the programmer knows that the C-bit, plus the bits already in the Accumulator, represent

avoid overflow/underflow, the normal 8 bits in the accumulator form the 'lower byte' total and the C-bit becomes the 9th of the 'high-byte'. It is easy to include a conditional branch, using either BVS or BVC, at the end of an addition to check the carry status. If C=1, then another memory location can be used to hold it. This brings us to the concept of double-length arithmetic.

Double length arithmetic

To add up a lot of numbers which we expect will overtake the capacity of a single byte, we can use double-length techniques. One memory location can be used to hold the low byte and of the result and another location to hold the 'high' bit and the C-bit can act as a continuity between the two.

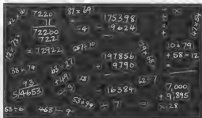
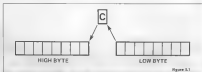
Figure 3.1 may help in visualising double-length ideas. To illustrate the technique, we will add two single length numbers together and store the result in two adjacent memory locations. The following coding is hardly worth laying in but at least it will show one of the many possible methods of handling numbers larger than 255. Assume that one number is in AC,00, the other in AC,01 and the double length result is to be

stored in AC,02 (low byte) and AC,03 (high byte) addresses. The flowchart in Figure 3.2 shows the logic behind the coding.

- From the following points:
- (a) The first number was added to an empty Accumulator with the C-bit cleared.
 - (b) The second number was then added to form the low byte result, if the result exceeded 255, the C bit will have been set to 1.
 - (c) The high byte result was then

```
LDH A, #0
LDH A, AC,00
LDH A, AC,01
C,C
ADC AC,00
ADDC AC,01
LDH A, AC,00
LDH A, AC,01
AND AC,00
AND AC,00
LDH A, AC,00
```

```
clear A,
clear for low byte result
clear for high byte result
clear C-bit
add first number
add second number
store low byte result
store 1 to high byte result
```



left empty if C bit was 0 or incremented if the C bit was 1.

To illustrate what actually happens at the binary level, let the original two numbers be 255 and 3 respectively.

```
1111 1111 255
0000 0011 3
-----
1111 1100
0000 0000
high byte low byte
```

Multiple precision

When two locations (16 bits or all) are used, the maximum

absolute numbers is increased to 65,535-decimal. The number, although large, may still not be enough to cope with some contingency. It should be clear that if the C bit can be used to provide continuity between the first and second bytes as there is no reason why it cannot be used to connect the second with a third byte. Three byte numbers can reach up to 1,677,721 which, in decimal, is nearly 17 million. In theory, the method can be extended indefinitely to a low number of any magnitude and precision to be handled.

Subtracting one number from another

As before, we must start with a precise definition of SBC.

"SBC: Subtract the number, as defined by the operand, from the running contents of the Accumulator, taking into account the state of the carry bit."

Unlike addition, the order in which the numbers are subtracted is important. Adding 5 to 3 is the same as adding 3 to 5. On the other hand, subtracting 3 from 5 is certainly not the same as subtracting 5 from 3. The may seem a trivial thing to bring up but it is so easy to code subtraction the wrong way round unless you remember that the subtraction is FROM the Accumulator. There is another pitfall with subtraction programs because of the way in which the C bit has to be handled; in fact it is because of this that it is better enough to merit extra emphasis.

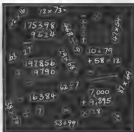
Before using SBC, don't clear the C bit. Instead, set it to 1 by using SBC.

The reason for this is tied up with the theory of two's complement arithmetic. Although SBC is provided, it is not unusual to use it because subtracting it from A can be achieved by adding -A to A. More, because a negative number is simply the two's complement of the equivalent positive number every bit is reversed, (flipped), including the carry bit. From this, we can deduce that if, therefore we clear the carry to zero before adding, we must set the carry to 1 before subtracting. This can also be justified by considering that during an addition, we "carry" a bit over to the next significant place but, during a subtraction, we borrow a bit from it and we can't borrow a bit unless it is already a "1". From this, it appears that the carry, in a subtraction process, should really be called the borrow. The following flow chart shows the procedure for subtracting the contents of SC20H from SC20H.



Figure 5.4

```
LDN SC20H      ;set carry bit to 1
LAC
SBC SC20H
STA SC20H      ;replace result
```



INSTRUCTION CODES AND ADDRESSING MODES

The following table lists the codes and addressing modes of the assembly opcodes.

LDR, LDR and LDA update the N and Z flags.

VIA, VTY, VTX and all the seven conditional branch instructions

assemble to carry on FORBING the bytes into memory or by means of the rotating program given in Part 3. For the benefit of those who may still be hesitating, before purchasing the MICRO, here is now a simple program is keyed in, the source code:

```
10 00000000
20 00000000
30 00000000
40 00000000
50 00000000
60 00000000
70 00000000
80 00000000
```

each time. The program, the assembly of the code line 50 BACK is a branch label for the remainder of the line which is a simple absolute address instruction with a without operand.

Line 70 This shows one of the most useful aspects of an assembler, the ability to use branch like a instead of laboriously writing out the correct relative address number.

Line 80 RTI refers we have not yet reached a RETURN here, subsequently, word is then the program back to BASIC.

Note the program is coded out well. This can be done by the programmer or, more easily by the special assembly pseudo-op-code FORBING. The only rule is that all address space must be left between each component of the coding.

The assembler will turn the program from the original source code, which the microprocessor does not understand, to pure machine code, which the microprocessor can understand. The assembler has a tough job in fact it has to make three 'passes' through the source code before it can complete the task. This is because the symbolic and branch labels must first be decoded before it is possible to complete the rest of the task. Fortunately, as the goal is to understand the programmer is not involved

Address type	Assembler	Hex code
Zero page	DRC hex	C0 to
Absolute	DRC hex	D0 to
Zero page,X	DRC hex,X	E0 to
Absolute,X	DRC hex,X	F0 to
Zero page	INC hex	00 to
Absolute	INC hex	10 to
Zero page,X	INC hex,X	20 to
Absolute,X	INC hex,X	30 to
Implied	DRX	CA
Implied	DRY	CB
Immediate	ADC hex	80 to
Zero page	ADC hex	90 to
Absolute	ADC hex	A0 to
Zero page,X	ADC hex,X	B0 to
Absolute,X	ADC hex,X	C0 to
Absolute,Y	ADC hex,Y	D0 to
Indirect,X	ADC hex,X	E0 to
Indirect,Y	ADC hex,Y	F0 to
Immediate	SBC hex	00 to
Zero page	SBC hex	10 to
Absolute	SBC hex	20 to
Zero page,X	SBC hex,X	30 to
Absolute,X	SBC hex,X	40 to
Absolute,Y	SBC hex,Y	50 to
Indirect,X	SBC hex,X	60 to
Indirect,Y	SBC hex,Y	70 to

Status register flags

It is important to know which flags are affected, if any, when an instruction has been executed. Ignorance or forgetfulness can lead to some pretty awful programming bugs which may be difficult to trace. The table of status flags affected appeared in Table 4.3 in Part 3 of this series but, for convenience and because flag status is so important, they are repeated below except that only op-codes which have so far been covered have been included.

ADC and SBC updates NZC and V flags.

CMP, CPX and CPY update N,Z and C flags.

INL, INY, OYL, OYX, INC, DEC,

none have no effect on any of the flags.

It is also worth pointing out again that the carry flag can be directly set or cleared by SBC and CLC. The overflow flag can not be directly set but can be cleared by CLC.

Using the MICRO assembler

This is the first part of the series you were strongly advised to obtain one of the assembler cartridges on the market. In particular, the MICRO cartridge (obtainable from Superbits). The sample coding which has so far appeared in the series has been deliberately kept as low key but, the pace from now on will hot up a lot as it is still possible for those who have not yet invested in an

As the flags, don't worry about what the program is supposed to do because the important thing, first is to analyse the format on a line by line basis.

First, notice that the assembler is now you to write line numbers. These are for convenience and reference only. You can't branch or jump to a line number in assembly language like you can in BASIC. Line 10, "0" is the format for telling the assembler where the first byte of the code is to be located in memory, in this case, SCRO.

Line 20 This is how you set an arbitrary label to an absolute memory location. It is called a symbolic address. Once this is assigned, the label SCRO can henceforth be used as a legitimate operand instead of stating the absolute address





Computer to printer communications may need an intermediary. David Crisp considers four Centronics interfaces.

IF YOU HAVE A PC AND A NON-Commodore printer you will need an interface. In order to get things working, the chances are that your printer is of the Centronics type as opposed to the 81210.

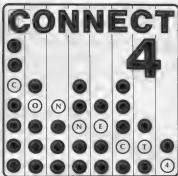
I have been through out a few of the Centronics' interfaces that are available from the cheap to the expensive and now you will find one here that is fit for the best for these particular needs.

If you have a dot matrix printer it is possible that you could, in theory at least, print out Commodore's full character set. The simpler interfaces such as the Stack will not support this, but the costlier ones will. Some interfaces will enable a post printer to completely emulate a Commodore printer. They do cost a little more but it is money well spent.

Stack Centronics interface

The Stack interface consists of just a lead and base board software to act as a driver, and on its own the lead wire is one of the commercial software where requires only a connecting lead. To use it as programs which you have written yourself you will first need to load the software before you load the program. Alternatively, to make the program a little easier to use, it expands to load it from within your program. This is done by having a line in your program saying something along the lines of — 10 P A = 0: THEN A=1:GOTO "LOADING NEW" G,1:END. If you have a tape-based set up change G,1 to 1,1. When your program is run it will load software and then continue to run.

The advantage to the Stack interface is that as the code is relocatable you should be able to find an area of RAM which is unused and store it away there. Some are built into the software so that it can be used and loaded into a particular part of RAM. As how to get in the manual regarding using the tape-based software to do, but the manual implies that a dot-based version is available. Unfortunately there is no indication on the box it would be so try whether it is dot or tape-based. This one of the cheaper interfaces available although it is still fairly expensive. However, the quality of the components used in the lead is very high. The cable itself is a thick rubber type as opposed to ribbon and the plugs at each end are



clearly and well.

It does what it is supposed to do, but it is not the most convenient of interfaces to use, and for what it costs of £10 it is overpriced.



RAM Electronics

The RAM electronics interface goes by the name of Tripple. It is a black box with two leads. One lead goes from the box to the serial port, the other to your printer. The whole assembly then plugs into the

serial port of the PC. One thing that cannot be missed on the Tripple is the length of the lead. On the one I received there was over one yard of ribbon cable. This makes a pleasant change as often you find that the lead is just that little bit too short. The manual, if it can be described as that, is simply a sheet of A4 printed on both sides. The Tripple is not a sophisticated interface so the documentation would seem adequate.

Because all the decoding is done in the black box it will not need or work any software on RAM. This is an advantage over the Stack. The Tripple is plugged into the serial port, so if a piece of software does which printer you have, you require work Commodore. This type of interface is nice as it means that any software which supports a Commodore printer will run. Using it in your own programs is also very simple as it runs like a Commodore printer. The instructions are clear and explain exactly all you need to know. Again this one will not support the full Commodore character set but is a good general purpose interface. For its price it is a reasonable buy; the only disadvantage is that it does require the use of the user port. There is not a through port on the Tripple, so if you wanted to go back peripherals the Tripple would need to go last. How this would affect the performance I do not know as none of the other things I use on my PC have a through





port either. So far, then, the best interface seems to be the I/O port with less conflict in memory, ease of use, and no need to add an external software driver.

To emulate or not

As you see, the above interfaces do not fully emulate Commodore printers. The first two emulate some of the more popular printers to do complete emulation. Both emulators like these give you a choice of printer systems extensively at least. Then as you configure the interface according to printer type, in both cases the main configuration is done with dip switches. They do cost more but with one of these you will have a very powerful printer.

Grappler

The Grappler has a unique principle which enables you to see exactly what is



in it. This reveals an 8 switch dip switch.

There was plenty of ribbon lead to reach the printer but the plug which goes into the serial port is very short. If you have a ordinary 54 pin D.C. but once again if you want an SX-64 modifications are required. The main unit plugs into the user port and on this one there is a through port so it is possible to piggy back. Another lead plugs into the serial port. There is another serial socket on the interface so again peripherals using the serial port can be piggy backed. Of course if you do piggy back then make sure that the Grappler comes before the printer.

Commodore made it plugged it in and started to try this new generation interface.



The manual consists of some thirty pages and all of it is needed. It is very much an American manual and tends to be a little cumbersome but does at least get us with the job. Many modes are available on the Grappler from straight emulation to listing mode. Most of these modes are set through the dip-switches and others can be turned on and off through software. Used as an emulation device it performs well. All the Commodore character set is printable and used with word processing packages it performs well.

Through the dip-switch it is possible to set the CD screen function, emulation mode, program listing mode, transparent mode, and text mode. These change the way the Grappler works. For instance, in listing mode instead of the difficult to decipher reverse graphics which Commodore set to show a control function, the grappier will print, however backward a couple of letters. If the command is a cursor up then Grappler will print garbage. This makes listing easy



Signature _____ **Student name** _____

Education is a continuous process and, with most of us using computers, Margaret Webb reviews some of the books which are trying to encourage education through computers.

Title: The Commodore 64 Learning Tree.
Author: Tony Noble
Publisher: Sigma Press
Price: £8.95

THIS BOOK'S A LITTLE PUZZLING. From the cover it appears to be a standard educational book but a quick scan reveals a collection of educational programs which involve a lot of typing. There are a number of introductory passages aimed at parents, teachers and children. Ignoring the inevitable amount of boring text, there is a useful guide to the control codes and some pointers on entering the program. A list showing for which age group each game is suitable precedes the games.

The games themselves are a good mix and are typically intended to help educate the player (if you only want to destroy invaders or something similar, ignore this book).

There are a number of games to help teach the younger age group (3-4 years) counting, simple arithmetic, simple numeric sequences and odd man out. While being useful, I feel these are rather a dry lot, especially when one appreciates how difficult it can be to maintain the attention of younger children.

The games for the 7 to 14 year olds are a lot more varied and interesting and include searching games using coordinates, logic, word games, homonyms, and some anagrams. For the older children, there were games listing French and Geography.

On the whole, the programs are well structured and use quite a lot of graphics. It is, however, slightly biased towards the older children. The reason for my initial confusion is

my uncertainty over the book's intended audience: children and gamblers from the parent but what about the parent or teacher who has typed in these rather long programs? They must learn something from the experience! The solution is simple. Why haven't the publishers released cassettes and discs containing the games so the games can be used without the bother of typing them in?

Despite my minor moan, this appears to be a very good book which offers a good variety of interesting games at a fair price.

Title: Commodore 64 Color Graphics — a beginners guide.
Author: Schaffer & Schaffer
Publisher: Reston Computer Group
Price: \$14.95

THE COMMODORE 64 IS RATHER A paradox. On the one hand it has some excellent graphics modes but on the other you can only use them by resorting to numerous POKEs. Most books give a thumbnail sketch on graphics but leave you no better off. This book is no different. It is based on the creation of bits which enable you to perform certain graphical operations. These include searching in the graphics screen, clearing the screen, drawing dots, lines, boxes, polygons, circles and filling shapes. Clearly such simple matters would hardly fit a book so the authors have wrapped it all up in the creation of a new scene. The idea is that once you know how to draw the scene, you can create your own pictures and amuse everyone.

The book's strong point is the ease with which each step of the process is discussed. The overall package is split into sections and presented in small digestible portions. You are taught to type in each section of a program and you try it while you wait to have it work. The theory of the operation of that program portion is then described in detail. The descriptions are well enhanced with diagrams, photographs and sketches. There are also exercises and summaries at the end of each chapter to help reinforce

the material learned.

As the book continues, the reader is introduced to more complex concepts. Particular emphasis is placed on the use of shape tables for the drawing of complicated shapes. After high resolution graphics the book progresses on to games. Look for the definition and placing of sprites are provided along with a number of amusing concepts. The majority of routines are written in BASIC, but at the end of the book a number of machine code routines are supplied to speed things up.

The actual text supplied isn't very useful and the work involved in creating a picture is rather excessive, but the book is worth buying for its excellent information on using graphics and its handy index.

Title: Basic a child's play. Commodore 64.
Author: R.T. Grauer, J. Gordon, M. Schenkel
Publisher: Prentice-Hall
Price: £18.30

THIS BASIC TEXT BOOK IS OF AMERICAN origin and is aimed at primary school children. It has been written by two primary school teachers and the mandatory college teacher. The format is typically American in that it makes extensive use of cartoon characters to make the text friendly and exercises to reinforce the points covered.

The book assumes that the user knows nothing about the computer and begins with an explanation of the keyboard and its functions. Having tagged out a few characters you are dealt through arithmetic in direct mode. The book continues at a slow pace covering more or less usual aspects of programming including variables, looping, conditionals and arrays.

I find that the book is an adaptation of a generic BASIC and with a few tweaks to suit the 64. For example, CHR\$(147) is used to clear screens in programs. POKE and PEEK are carefully avoided as are cursor control codes and colour. If, however, you really want to learn BASIC without any frills, it would do the job.

To most like, the book is suitable for younger children since it covers a variety of subjects in a readable style.

Title: Step By Step Programming — Commodore 64
Author: Phil Cornes
Publisher: Dorling Kindersley, London
Price: £5.95

ONCE YOU HAVE BOUGHT A computer you can put it to several uses — games, playing, education, business or, better still, programming. A vast range of books aimed at teaching programming is

REFERENCE LIBRARY

computer available. This book offers a different approach: at every stage, there are screen shots of listings and program results.

The book progresses from an initial discussion of hardware to instructions on setting up the machine. There is even a photograph of the computer's interior in case you feel the urge to take your computer to bits. The photographs are clearly labelled so that the function of every key and component is explained.

The remainder of the book pretty guides the reader through the aspects of learning BASIC, starting with an introduction to using the key-based and on-screen information to direct mode. Sections on output, graphics, BAS-CL, PQAP and PEEK, sprites, sound and random numbers then follow, together showing PEEK and ASCII codes and some design grids are at the back of the book. The book may not teach you to write commercial programs, but it will show the basis of what the 64 can do and how to write reasonable programs. Overall the standard of the book is excellent with extensive use of colour and graphics. The book is to be highly recommended.

Title: Random Alley
Authors: Michael Orkin
Publisher: Reston Publishing
Company
Price: £6.95

THIS IS AN AMERICAN COMPUTER book with an interesting and novel approach which should appeal to children in the 10 age group. The book is unusual in that it deals with chance.

It is not out as an adventure story with a central character called Harold who is a boy with a penchant for computers. He has a desk top and a computer and adventure. One of his pastimes is going for a fast ride not to get anywhere in particular but just to have some fun and see how quickly machines process. One day he finds himself in a place called Random Alley. This place is new to him and is populated by some very strange people.

The first person he meets is a tremendous gambler on his way to a roulette game. Here, all because money has stop he faces a coin to decide whether he should get off the bus or not. He uses the same tactics to decide which way he goes at cross-roads. Harold, using his pocket computer, tries to show them the gambler, that no coin tossing has an equal probability of showing heads or tails. Harold continues his travels and meets other people each dilemma using a random throw.

Each chapter starts with a short portion of the story describing Harold's adventures. The concepts developed in

each story are expanded and illustrated by short programs which the reader can type in. Significant detail is given with the programs to show how the program works and to offer some programming guidance. A wide range of ideas are covered including coin tossing, dice, playing card selection and artificial intelligence/random message generation. At its format cost, as is the program listing. The programs are generally short text, thus forty lines so that typing them isn't too much of a chore.

The story is compelling enough to keep most youngsters interested. The text is augmented with many good quality illustrations, both coloured and monochrome. I found it almost enjoyable and enjoyable to read.

Title: Intermediate
Commodore 64
Author: Guy Grimes
Publisher: Reston Publishing
Company Inc.
Price: £14.95

OK, SO YOU'VE EXTRACTED ALL THE information from the Commodore 64 handbook and now think you can write a mini program! What do you do next? This book deals with a host of more advanced aspects and is intended to extend your knowledge and experience. The first two chapters should be compulsory reading for programmers so that they deal with structured programming and the design of algorithms. Using the concepts introduced, it is easy to develop most, if not all, easily understood programs.

Having established a few good rules, the book divides smoothly into a fairly section on file based eg on disc. This starts with sequential files and moves on to random access and PAM. There is a fully treated section on machine code which does little more than discuss assemblies but it does give the author the excuse to use machine code routines in the rest of the book. The remainder of the book covers the use of graphics and sprites, the complex subject of graphics is dealt with in an excellent useful real time code routines are supplied. A particularly strong chapter discusses the more colour aspects of the 64 including the use of the CHARGEN window to extend BASIC, increasing execution speed and memory banks.

I find the American style a little tedious but the treatment of quite complex topics is masterfully concise and readable. There is even the odd cartoon to encourage a smile.

Overall this is a very strong book which is a useful source of information and will serve as a good reference guide as well as educational book. In many ways, it is better than the Commodore Programmer's Reference Guide. Well worth a close look.



**More software steps
into the spotlight this
month. Our reviewers
are here to enlighten
you about it.**

Toy Mania

★★★★
Action
\$29.95
CBM 64 • joystick

THIS IS WHAT I CALL AN addictive game. It is original and the graphics and sound are superb. The story is about Morton whose job it is to maintain the machinery in the toy factory (enough! The problem is that the toys are revolting and to stop them you have to turn them on off that make the machines which contain the toys. Hmm, if that isn't enough, there is this funny Batty style toy called Hefty who, when turns the system back on again, he, while parading around has baggage loose on the toy factory, you have to get rid of the toys. Along the different floors of every screen you will find those Platforms of terror jumps on a pile where there is a toy in the opposite platform, he can climb the toy and get rid of it. He can also get rid of Hefty by the same means. A point to bear in mind is that if you do some wrong, there gives the chance they will do it to you.

Contained in the game along with the above is a bonus level and a test level. I won't tell you what happens but I do recommend it if you enjoy puzzling games.

S.J.A.

P.C. Fuzz

★★★
Action
\$29.95
CBM 64 • joystick

IF YOU'RE CONTEMPLATING DEPENDING your pocket for this latest offering from Amiga, then, quite frankly, I wouldn't bother. This game does go to a level I have never why it is called P.C. Fuzz and not P.C. Field because that would have been giving the game away.

With its on parallel on the latest Amiga's

can you believe that P.C. Fuzz has to pretend the Mob from going by away the cash from the banks. The Mob are rolling bombs down the street to catch a lot of his take and there is a bunch of punks and drunks out looking for trouble.

You have been given four lives and you lose a life every time you are caught by a bomb or any of the other obstacles. Points are scored for destroying the bombs, and catching the cash-laden balloons with your elasticated truncheon as well as for arresting the members of the mob.

S.J.A.

SOFTWARE SPOTLIGHT



Penguin Study Software: Komos and Juliet, Twelfth Night

★★★★
Penguin Books Ltd.
£29.95
CBM 64

FROM THE POINT OF VIEW OF operation, use and display, these two programs are essentially identical, and it is therefore convenient to review these together.



most of us will remember buying the small printed guides as an aid to passing GCSE or IGCSE English literature. In these packages, Penguin have come up with computerised guides which are also easier to use and more interactive.

In effect, you are given a detailed database containing a huge pile of useful information extracted from the play. The menu gives a list of people and a list of themes which you can incorporate in a search. You can select up to three items and the program will search for all occurrences or aspects in the play which relate to these criteria. You can choose to search the whole play or selected acts. The results of the search are returned as a series of open-ended questions or questions. Each item is accompanied by suggestions for further searches.

The important point to bear in mind

with any educational program is what it will do for you. These programs are not intended to teach you lots of useless facts. For example, this is a small IGCSE class who said what, when and why, since most of English literature questions involve the examination of the themes in the play and the underlying ideas. In other words, these programs will teach you ideas, insights and the ability to examine the broader aspects of literature. It is assumed that you have done the basic work at school or college and you simply need your grasp of the play improved.

In operation these programs are most impressive. Loading is by Move and is smooth and quick. The selection of criteria is made with the space bar and colour is used to highlight your choices. The search speed is reasonable and the screen presentation is neat. My only

complaint is the lack of a hard-copy option. Most users will want to get a copy of the results of their searches to add to stock of the text. Overall, two superb packages which are a joy to use and must be worthy of serious consideration.

A.W.



Case Fighter

by
Bubble-Box

15.99

OS/2, MS-DOS, Spectrum

I AM NOT TOO SURE WHAT to make of this new game from Bubble-Box. On the one hand it has good graphics and on the other (for me at least) the game content after a few levels, got repetitive. The game is based on shooting everything that moves and, if it can't be shot at that time, then getting out of it as fast as possible. What you have to do is complete a series of the 16 levels of caves as possible. You have a time limit in which to complete each level and every level is a little more difficult than the last.

The graphics, even on the game are of a very high



Whisker On On An Arabian Nights

by
Marscape

15.99

OS/2, MS-DOS, Spectrum

Whisker On On An Arabian Nights

As about Nights story that took all day to load it minutes, I am disappointed. I think it could have been told from a far lower program. Nevertheless, after loading the game description, it sounded as if it

could be a lot of fun. I seem to recall, in the cave and desert part, a game by Synapse called *Allegiance*. This is by no means the same, but the fighting system used is very similar.

The idea in *Whisker On On An Arabian Nights* is to free the Golden City of the evil caused by a nasty person of weak called *Blivet*. This person has hidden himself away inside the Inner Sanctum. Your job, as a good person, is to get passed by the guards, defeat a magic jar, free the man that imprisoned on the same level as *Blivet*, and capture the Arabian Bad guy.

It is essentially a fast level game. The first is to land by the Palace that is where the fighting system is used the most. While flying along you are attacked by the guards. To shoot them you must hit them with your sphere of rainbow power. Finally, by using the power while passing the 'Bad' house, to move your crystal just past your 1000 of the house, and use as power. The other three screens involve finding an open window, lighting some torches to find the jar and finally, catching a man named

S.P.R.

Response	Percentage
Yes, the current system is the best one for the country	55%
No, the current system is not the best one for the country	45%

100% 100% 100%
 100% 100% 100%
 100% 100% 100%
 100% 100% 100%
 100% 100% 100%
 100% 100% 100%

APRIL 14, 4% ANTI-AGE An gamer for *Diablo III* and *Warcraft* participated in the UK's first "cancer by keyboard" event. The one-hour push took him from a game-style game to no response at all. A golden shield was awarded to him as an old Acer image. Waiting for you inside the store will see all sorts of strategy. However, to make things a bit easier you can find boxes which, when you open them, could contain game, enough to get you back to work.

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 395–402

ready to load half-a-dozen times. I was much relieved to see that level that appeared at the start of the game! During loading is the screen is adorned by a two-screen picture. Once I had chosen my level of play (I took, I was faced with the daunting task of remembering what had on the 11 screens was not

In a particular sense made it a role rather than a special title, the control instruments could not be put on my desk I don't know. But being low, the game is exciting, only the controls are not designed. The graphics are good and there are a small number of sound effects, but I am afraid the controls were "cheap" too.

1000 1000 1000 1000

Ministry of Education

100% 100% 100%
 100% 100% 100%
 100% 100% 100%
 100% 100% 100%

As for a CRAP-BC ADVIS-
tory, it's time to review old
regulations, find out what's work-
ing and advertise it and
then they look at one block at
a time, and it's like a giant maze.

I can't explain why, that's just how it is. In the case of Shari'at Memon it was one hell of a better deal than Boston has disengaged from. Memon Memon and memon has it that there is hidden wealth within them that others don't see.

Despite the howling howls of wandering ghosts and hidden traps, perhaps it's worth giving it a bash. Solve the puzzles and mysteries, and you could be home, and dry, but even the

After meeting all suggested guidelines, we were surprised and pleased to receive an email from the editor stating that our paper was accepted for publication.

Mr. and Mrs. M. M. M.
Well I had my usual run of
success in the last room. A
dash occurred, marked by an
approach was, have failed after
27 moves - completing 8% of the
adventure - or words to the
effect: Good luck, my dear,
before you can rest.

111

**SOFTWARE
SPOTLIGHT**

Registers, Assembly Language Programming for the CRNA-4

Plummer, David
at 12 Feb
at 10:00 AM

THIS PACKAGE USES THE
following methods, names of files
and programs to take you
through the rigors of the ring
assembly. In addition, it shows you
anecdotal info.

The cassette comes with two useful programs which are rather handy tools. On the B-side is a Binary-Hexadecimal Tutor. This program seems to be the nicest use of learning the differences at some points between Decimal, Hexadecimal, Binary and Binary Coded Decimal. The program is most concise

and easy to use. Once you're confident on your conversions, there are exercises built in to test you.

The main program on the tape is a formatted sequential machine code. Mark this program you can also order such as some real-time, interruptible code and such as a compiled-in interpreter. Additionally, you can make your own code and save on hard disk use of the machine code monitor included in the package. The response to the added advantage that an example of a program tape (BIB) is encountered. This answer you to protect your program from accidental erasure.

The assembler is both comprehensive and includes tables for local and global symbols.

My main complaint is the lack of nonstandard integration. It's not really an "it" to give that it is an answer on its own terms. It's not. There are insert and remove commands to help manipulation of your code and you can convert your first object code to data structures for use in BASIC programs.

The seventh rule covers 750-800 ft. deep when used in connection with the earlier first-book included in the package. The book addresses

The coverage of mammal biology is a well-thought, well-organized, and progressive study in the use of existing published materials and resources available in 2004. When you've learned all there is in the book, it can serve to be a resource in a reference work giving details of the life stages of all rodents and the full range of life and more on any

That is an excellent package which certainly does the job of a volume no one

Figure 1 consists of four bar charts arranged in a 2x2 grid. Each chart represents a different level of agreement with the statement 'The government should do more to protect the environment'. The y-axis for all charts is 'Percentage of respondents' ranging from 0 to 100. The x-axis for each chart is 'Level of agreement' with categories: 'Strongly agree', 'Agree', 'Disagree', and 'Strongly disagree'. The data is as follows:

Level of agreement	Strongly agree	Agree	Disagree	Strongly disagree
Strongly agree	100%	0%	0%	0%
Agree	80%	20%	0%	0%
Disagree	60%	40%	0%	0%
Strongly disagree	40%	60%	0%	0%



Bricks
★★★★
Palace Software
£5.99
Vic 20 • joystick

THE BASIC AIM OF THIS GAME IS TO climb your way from the bottom of the screen to the top. In order to do this you have to avoid falling bricks which come hurtling down. Once the bricks settle these are used as your stepping stones to the top. Sounds easy — try it! — More often than not you are hit or trapped — hence you have to start the game again. There are six increased or 'ratcheting' levels. As the bricks start disappearing from the bottom of the screen making it even more difficult to reach the top.

The game loaded very easily and it was simple to get started. The graphics are simple — movement is jerky and it sits square at a time which is very common in the unexpanded VIC 20. The sound is practically non-existent apart from the odd 'Bip' — Ping and explosion.

In behaviour the game is quite addictive and I must admit I haven't as yet reached the top which is rather interesting when my 15 year old brother finds the game a little 'boring' clearing screen after screen. Unlike many VIC 20 games the game can be paused by pressing letter R. Overall quite a good game from Palace Software. F.W.M.



Squish!
★★★★
Palace Software
£5.99
VIC 20 • joystick

TRAPPED AMONGST AN ARMY OF bugs your task is to exterminate the bugs by pushing rocks into them in order to crush. If the bugs manage to make contact, you die immediately. If you are hit by one of their missiles you are immobilised out of existence. If you manage to exterminate three you are warped onto the next level — each a similar except it has more bugs and faster and more furious action.

There are twenty levels of play and on a few levels the aliens are invincible. The game can be paused at any time by pressing the letter R and play can be resumed by using the letter T. The game loads first time and starts immediately. The joystick response is good and the game is not easy, yet not too difficult making it interestingly addictive. The graphics are very basic and leave a lot to be desired. The sound is not very good, however these faults do not put you off playing the game.

Not a bad game from Palace Software I would recommend this game to any unexpanded VIC 20 owner.

F.W.M.

American Football
★★★★
Atari Games
£9.95
Commodore 64

MOUSE, SHUTTLE, POCKET, Bomb, drive, swing, reverse and centre. Sounds offensive doesn't it? Well not so much it is, but only in the context of football, American style. Yes this is good fun and there are the offensive passing and running moves in the game. And it's good, real good, particularly if you have a strategic brain.

Each game takes an hour and you can play against somebody else or against the computer itself. But watch out if you choose the latter. It's been programmed to monitor

your moves and to try and predict your next one whether you're attacking or defending.

Included in the package is a computer screen or booklet explaining all about American Football and how to play the game, computer style. The game period is split down into four quarters. Points are scored for taking the ball into the opponents end and for kicking a field goal and you do this by outwitting the opposing team with the choice of plays. The 3 are you decide to make are acted out on the screen by the 'teams'. Other data displayed on the screen includes the yards you have to make and how many plays you have left to do it in before you lose possession of the ball and have to go on the defence.



Although the graphic representations of the game is not all that brilliant, it doesn't detract from it. The first sixty minutes finished by and I only

see 24 points to 31 points (also passing) that you don't need to know anything about it to play. Definitely worth a new P.d. in.

B.J.H.

SOFTWARE SPOTLIGHT

Basic Adventure Part 1.

★★★★
Honeyfield Software Ltd.
1985
CBM 64

IN COMPARISON WITH A number of Honeyfield Products, this package uses a combination of software and textual information. The core of this package is to introduce BASIC to the 7 to 11 year olds and in each stage a pretty good job.

A fairly novel approach to teaching is adopted by chronically the adventures of

Dr. Mathew and using his activities as the vehicle for teaching. This Wells-like character is whisked into space by his new improved teleport machine and dumped in the space ship belonging to an alien called Albat and her robot. The hyper-drive of the ship malfunctions and the only means of taking on less is a Commodore 64 in the ship.

From this point, the reader is gently and safely guided through the concepts of BASIC and the use of the commands. Each step is cunningly slipped into the text so that things progress at an easy pace. The

text is nicely illustrated with line drawings and is very well presented. The general idea is that the child can sit at the computer and follow with the machine whilst reading the book. It affects nothing through play.

The tape contains three sample programs on one side which are also discussed in depth in the text. This is a nice touch since it saves a lot of typing. On the other side are four further programs which

give further hints and help on the use of BASIC, using manipulation and line numbers. At the rest of the book is a substantial section which gives you greater detail on the material covered in the adventure. This is more of a reference section which is for use once the basic material has been absorbed. A comprehensive index is included to provide easy access of literature.

A.M.

Bredon's Basic

★★★★
Molten Software factory
1985
CBM 64

MEDIUM OF THE SHORT range of the resource BASIC in the 64, a large number of companies are producing extended BASICs of this type. On opening the package you immediately get five surprises. Firstly, there is both a database counts, giving instructions apply to all 64 systems. The second revelation is the superb instruction manual. The 80 saved space is approximately three-quarters of an inch thick, very heavy duty card and is a joy to use. A combination of colour coding and summary lists makes access to all commands easy. The software is enhanced by using each page to describe a single command. So much for the documentation.

Now, how did the software perform? Loading was trouble free and the machine was run with about 20% of memory left. The manual claimed that some 110 basic commands are supplied, and whilst I haven't counted them, I can tell you that the commands cover the usual areas of high resolution graphics, sprites, sound, structural programming, file commands, programming sub, error trapping, numerical manipulation and input/output. Most commands performed satisfactorily but were not particularly impressive. I noted one or two omissions such as ROMABLE, CIRCLE, FILL, and no commands for the use of timer interrupts were offered. Two particular problems were the use of PUT for POKE (a low but some sort of incompatibility) and the use of ROP instead of PRIC. Both are

certain to cause some confusion.

On the whole this is a well written package which operates in that top class way. The package contains a number of demonstration

routines which show the capabilities of the system well and should provide guidance on the usage of commands. At the price, this extended BASIC represents excellent value for money.

A.M.



Strike Force

Bubble Bus
16-bit
CBM II+ joystick

SHOOT, BURN/STOP, LOAD and prepare to meet the doom. The Strike Force is an it's war and you are the last defender against what is undoubtedly a very strong force. But just

because you are outnumbered and the life count is critical you with that galaxy under number 1. And no, don't be down hearted.

The object of the game is to shoot and destroy tanks and enemy weapons from the first. The copper wire through to the bomb, and the assumed personnel camera and supplies. You have a set time period in which to destroy each

enemy plane and 5 lives before you yourself are killed. You destroy most of a percentage of an or even gun barrels and a can be raised or lowered in terms of their range by pushing forward and pulling back on the joystick.

Beginning to expand that don't. An aid facility has been incorporated to help you stack the odds more in your favor. This decreases the size of the

enemy force as a difficulty level of 1 to 5, does the enemy down. Inevitably the accuracy you need to destroy the enemy and measure the rate at which you can hit your guns.

S.M.

Tact

Bubble Bus
16-bit
CBM II+ joystick

HACCHHI! This is kind of those amazingly frustrating arcade games in which you can see the enemy about to move but you haven't got the coordination to get out of the way. And then, having lost, it immediately gets you coming back for more in a vain attempt to beat your previous high score. Yes, that's life alright.

You are in charge of a little war who can move and turn up, down, left and right, only he can't do both at the same time. The object is to clear 10 rooms and then 10 'super' rooms of between 20 and 250 stationary bugs and a variety of marauding robots. Each room has a different theme from tanks and evil eyes to carnal sin and women. You

have to shoot the yellow pest to clear the room before the advancing walls crush him. After every two rooms there's a bonus room, but be quick to collect the bombs as this is the only way to destroy the wretched last one. Using the bombs will also provide a temporary lull in the marauding nasties and advancing walls. Any life deteriorates the bombs.

For part of the game with a generous 5 lives and you'll need them if you are able to reach the rocket room at the end of the road. As this first game is for every 10,000 points gained and a life is lost if you run into a bug, touch a robot or get crushed by the walls. Make no bones about it, this is a good, solid arcade tapping game.

What it lacks in innovation is more than made up for in frustration value.

S.M.

Zenpi

Activision
16-bit
CBM II+ joystick

NOW HERE'S A LITTLE BRITANNIA for you. I do not know how much of the window has on the back are true, but according to Robin Jarman of Zenpi, you have to connect all the streets together by their paths and when this happens Zenpi is won. So, that's the story behind the game and I can say that I enjoyed it immensely.

When the program had loaded, I was greeted by an animation of the main menu. Pressing 'T', got me into the first screen in which a small set of paths are interconnected by connecting the connected paths, and making them, you can connect up with the unconnected paths. As soon as

they are all joined, the screen is finished, your points are tallied up and your character is moved onto level 2. On each progress or screen, more paths are to be made.

It sounds easy, but when there are time limits on each screen I found it presented more of a challenge. Another bonus is that on the first five levels a segment starts to countdown. If you reach a before it goes to 0, extra points are awarded. If you do not reach it in time, it is a failure. I found this frustratingly, this stopped me from reaching the level. It's worth saying it, if possible, but then, you don't have to take my word for it, take Robin's.

S.M.P.

Kobolborn War

Blay
16-bit
CBM II+ joystick

WHAT'S ALL THIS GLOVE & HATE, drive imagination at war on the down road. Let me summarise. There was this magazine called what I named of a satellite under that had been smashed to pieces and scattered through time. Too long in the tooth to go and fetch them himself, he resolves the Kobolborn (his character) to do the big work and even says a pair of wings on his back to make his move more so. As the controller of the joystick, you have become the guiding

re-max. With a strange square lens at end under your belt, you are urged to travel back the 100 mil per year in time to gather the first fragments. And the glowing time gate to another period and gather yet more fragments. Careful, though.

At the end of it all there's a message from the magazine telling Mr Wing how he was sent on the postmodern quest. Be one of the last to see it time all about it and you could be one of the lucky 100 to receive a free copy of its next game, The Fall Guy. Need you to say this is a little more than a maze game on a scrolling screen and a central character not too responsive to careful direction. Not exactly much to write home about is it.

S.M.



Improve your BASIC programming with advice from A.P. and D.J. Stephenson on strings, randoms and time.

BASIC PROVIDES A SET OF keywords which can perform complex logical operations on single, separate characters, or blocks of them, within a string variable can be discarded, rearranged, reversed or order as changed into equivalent numerical or other forms. Before discussing the function and syntax of the keywords, it is pertinent to request why we would want want to mess around with strings. Remembered telephone numbers and initials as starting points. If, at some stage in a program the screen message "Enter your name" appears, you would probably answer in the same way—for example, "Jenny Bloggs" or "J. Bloggs". Within the computer, it would be more convenient, both for sorting and searching purposes, if the names were stored first and the initials or surnames last. This would entail using one of the available string handling keywords for rearranging the input obtained from the keyboard.

String handling is also useful for reducing the amount of input required from the keyboard. For example, a program which tests knowledge in the form of questions and answers on capital cities of countries that, if not possible, spelling errors to avoid repetition of an answer or spelling grounds a program can be arranged to accept, say, the first three letters of a city—BUL could be accepted for BULGARIA. It is convenient, in fact, almost essential, for individual records within a file to be accessed by the full name or by the first one or two characters of the name. It is often possible to arrange for a few characters in the middle of the full name to be sufficient for locating it from within the file. This is not only to save time during keyboard entry but



because the full name may have been forgotten, in which case the record would be lost forever. Converting plain language messages into coded form and subsequent code creating is another application which can benefit from subtle use of string handling keywords. There are scores of other uses but it is time we started examining the keywords and examples. Several short programs, or rather bits of programs we shall call modules, will follow. They are described in the text rather than by the usual REMarks. When you are learning programming design, REMarks often make modules look frightfully complicated—the opposite effect to that intended. After you learn these designs and start writing lengthy programs of your own, the REMarks are of great value.

Finding length of a string

A program will frequently want information on the length of a string. For example, how many characters there are in, say, AB. The keyword to use is LEN, the format being

```
L = LEN(A$)
```

Example

```
100 INPUT "ENTER A WORD OR SENTENCE " A$
110 L = LEN(A$)
120 PRINT "YOU HAVE ENTERED " L " CHARACTERS"
130 GOTO 100
```

This is, of course, an endless loop so you can do it just out of it by pressing the STOP/STOP key. Try it with strings of different lengths to confirm the number of characters, letters, numbers, punctuation and even spaces are included in the total length. Note carefully that although AB is a string variable, its length L is a numerical variable.

Splitting off leftmost characters

The key word here is LEFT\$, and the syntax is

```
LEFT$(A$,N)
```

where N is the number of characters to be split off from the left. For example, if AB contains the word ABLETS, and we write LEFT\$(ABLETS,3), then LEFT\$ will contain the letters "ABL". Clearly, we can't split off more letters than the original word. The following line lines can be used to try out LEFT\$ with different inputs.

```
100 INPUT "ENTER A WORD " A$
110 INPUT "HOW MANY CHARACTERS TO BE SPLIT OFF " N
120 B = LEFT$(A$,N)
130 PRINT B$
140 PRINT A$
150 GOTO 100
```

Note that the original word in AB is preserved intact and not corrupted in any way by the splitting.

Splitting rightmost characters

The keyword here is RIGHT\$, and the syntax is

```
RIGHT$(A$,N)
```



This can be tried out using the same test program as above but with line 120 changed to RIGHT\$(A\$,N).

Let's try something a little more ambitious, assume 100 assorted words are in an array AS, and we want to print out only those words having four letters in which the first letter is F. It could be done as follows:

```
100 FOR I=1 TO 100
101 IF (LEN(AS(I))=4 AND LEFT$(AS(I),1)="F") THEN PRINT
AS(I)
120 NEXT
```

Make sure that some earlier program segment has initialized the assumed words in the array AS, by — I don't wish to distract you from the IF statement — ensuring that only those words which satisfy both conditions are printed out.

Sometimes, we may wish to print all one common character from words, rather than from one end of, a string. The relevant keyword is MID\$, and the syntax is:

MID\$(variable, N, K)

N is the number of characters to be split off, starting K characters from the beginning. For example, suppose the string variable AS contains "COCUMBER" and we write, MID\$(AS, 5, 3). This will take off 3 characters, starting from the third character. That is to say, AS now contains "CUMBER". MID\$ is an intrinsic and intrinsic means BASIC keyword so a few extra examples are justified. Assume that AS contains "COCUMBER".

```
If we write: MID$(AS, 1, 1)
then we will have AS, 1, 1 then AS
If we write: MID$(AS, 1, 2)
then AS will contain "CO"
If we write: MID$(AS, 1, 3)
then AS will contain "COC"
```

```
100 INPUT ENTER A WORD OR SENTENCE "AS"
101 L=LEN(AS)
102 FOR I=1 TO L STEP 1
103 PRINT MID$(AS, I, 1)
104 NEXT
```

Since the FOR loop is stepping forward, the first character printed is the first character of the original. The printout at the end of line 103 means the letter is all on the same line — providing, of course, there is room on the line. If you turn out the simulation, the printout will be in the next column.

Converting a number to a character

Computers can only store numbers. The ability to store errors, punctuation marks and various other characters is an illusion. The fact is that all characters available on the keyboard are given a specific code number. This code or generally known as the early days of computing is the American Standard Code for Information Interchange, more fully abbreviated to ASCII. The full code is given in the Last Manual and is repeated all throughout in nearly every computer book published as only a few relevant entries are abbreviated form are repeated

The keyword for converting the ASCII number to the corresponding character is CHR\$, using the syntax:

CHR\$(N)

For example, if we enter the line

```
PRINT CHR$(50)
```

the screen will display the character "B". The following two lines will show the correspondence between ASCII numbers and the upper case letters:

```
100 FOR I=65 TO 90
101 PRINT CHR$(I) " ";
120 NEXT
```

The ASCII codes, 0 to 31 have not been standardised and are left for Control Codes, specific for a given computer. In fact the Commodore 64, pays only lip service to much of the standard ASCII code because of the need to squeeze in a range of special graphics systems. However, the digits, upper case letters and standard punctuation marks remain as per ASCII.

Converting a character to code form

As we have seen, CHR\$ converts a code number to the corresponding character. For the reverse process, that is to say, converting a character to its corresponding code, the keyword ASC is used, the syntax being:

ASC("character")

You may have noticed that in the last example we could have used LEFT\$(AS, 1) instead of the LEN\$(AS). Incidentally, such as the other case in which there is a letter, a crossover in function between keywords.

Let's see if we can enter a word as sentence at the keyboard and print it out backwards — it may be of some use in a word game.

below

	ASCII CODE
Digit	Upper case letters
0 = 48	A = 65
1 = 49	B = 66
9 = 57	Z = 90

For example, if we enter PRINT ASC("A"), the number 65 is displayed. Note that the literal character must be enclosed in quotes. You are not obliged to consult the Last Guide every time you need the code number for a character. Simply consult the above PRINT line in direct mode and the code, including any of the special graphic characters, will be displayed, subject to the proviso that the character is displayable. (Control codes do not have possible exceptions.) The character can be in string variable form instead of letters. For example, PRINT ASC(AS) will display the code for the character stored in AS. However, if AS contains more than one character, only the code for the first character is displayed.

Numeric and string conversions

Just as required to convert a numerical value to its string form or vice versa. As we discussed in an earlier part of the series, string variables and numbers are able to be mixed. We cannot write A=BB without causing a half error message from the BASIC interpreter. However, it is possible to achieve harmony in spite of this mismatch, by using A = VAL(BB). The two computer keywords are VAL and STR\$, the syntax being:




```
100 PRINT CH$;H$;Y$;M$;D$;A$;S$;R$;G$;B$;I$;O$;
110 FOR A=1 TO 10
120 FOR B=1 TO 10
130 H = INT(RND*(255-0)+0)+0
140 A$(A) = A$(A)+CHR$(H)
150 NEXT B
160 PRINT A$(A)
170 NEXT A
```



The module, as it stands, will generate and load the array A\$(A) with 10 random "words" each of 10 characters. The outer loop is responsible for ensuring there will be 10 numbers and the inner loop generates the 10 random items which form each word. The words are, of course, but they aren't, really — the most random, the better it performs as a test pattern. Even so, line 130 concatenates each random character to form a 10-letter word. The characters are obtained by using CHR\$() to convert the random number to an upper case letter. The line

numbers are raised, a pair of cotton that we developed in by trial and error — an admission of human frailty for which no apologues are offered.

Time and time delays

All the computer functions within a computer are controlled by a central oscillator known as the master oscillator or 'clock'. The frequency is very high — millions of pulses per second — in order to enable the device to operate so fast that your programs produce results 'instantaneously'. To make use of this oscillator for some time keeping, a special device chip is used for counting-down the high frequency to a reasonable value. One basic unit is called the 'tick' which is a fraction of a second. As each unit a computer is switched on, the clock starts and the ticks go up and up. There are two basic variables, T1 and T2, which the computer keeps continuously updated so they contain the current elapsed time.

T1 contains a six digit

number in the form hh:mm:ss, where hh is hours, mm is minutes, ss is seconds that are digits. For example, if 5 hours, 45 minutes and 3 seconds have elapsed, T1 would contain the string "05:45:03". It is possible to read T1 at any time, including the 'end' time by using a command. To set the clock to a given past time easily, write T1 = "00:00:00". The other variable, T2, is a pure number, in fact, recording elapsed time in total ticks. You cannot directly alter the value of T1 although it is automatically reset when you assign a new value for T1. To match the clock go up and up, try this:

```
100 T1 = "00:00:00"
110 DO: B = 1 TO 10000
120 PRINT T1
130 NEXT B
```

Because it is made use of T1 a delay of 5 seconds can be introduced by the line,

```
100 DO: B = 1 TO 1000000000
```



Time delays

Occasionally when it is necessary to slow down a program by introducing a time delay. One way is to use a FOR/NEXT loop which simply counts up from 1 to a low time, nothing more. For example,

```
100 FOR H = 1 TO 10000 NEXT
```

If this line is introduced within a program, everything is held up while the computer counts up to 10000 — which won't be very long. The more elegant

The instantaneous value of T1 is first assigned to B. The computer is then stopped at line 100 and T1 is made up to extra 100 million plus (line 110). This method is accurate and more convenient than messing around with FOR/NEXT loops. In games programs, a random delay is often required in order to place the player on a state of tension so that he/she can never be quite sure when the next 'message' will be sent on to the screen. This can be arranged by changing B to 1000000000, where R is a previously derived random



Superb 64

[illegible][illegible]

Table 1

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VIA WENTZ 64

1. The first step is to identify the problem. This involves understanding the symptoms and the context in which they are occurring. It is important to gather as much information as possible about the problem, including any relevant history and current circumstances.

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There is but a narrow margin of error, and some small adjustments are necessary to the data.

Accession Number	Accession Date	Accession Price
Accession 1000000000	10/10/2000	1000000000
Accession 1000000001	10/10/2000	1000000001
Accession 1000000002	10/10/2000	1000000002
Accession 1000000003	10/10/2000	1000000003
Accession 1000000004	10/10/2000	1000000004
Accession 1000000005	10/10/2000	1000000005
Accession 1000000006	10/10/2000	1000000006
Accession 1000000007	10/10/2000	1000000007
Accession 1000000008	10/10/2000	1000000008
Accession 1000000009	10/10/2000	1000000009
Accession 1000000010	10/10/2000	1000000010
Accession 1000000011	10/10/2000	1000000011
Accession 1000000012	10/10/2000	1000000012
Accession 1000000013	10/10/2000	1000000013
Accession 1000000014	10/10/2000	1000000014
Accession 1000000015	10/10/2000	1000000015
Accession 1000000016	10/10/2000	1000000016
Accession 1000000017	10/10/2000	1000000017
Accession 1000000018	10/10/2000	1000000018
Accession 1000000019	10/10/2000	1000000019
Accession 1000000020	10/10/2000	1000000020
Accession 1000000021	10/10/2000	1000000021
Accession 1000000022	10/10/2000	1000000022
Accession 1000000023	10/10/2000	1000000023
Accession 1000000024	10/10/2000	1000000024
Accession 1000000025	10/10/2000	1000000025
Accession 1000000026	10/10/2000	1000000026
Accession 1000000027	10/10/2000	1000000027
Accession 1000000028	10/10/2000	1000000028
Accession 1000000029	10/10/2000	1000000029
Accession 1000000030	10/10/2000	1000000030
Accession 1000000031	10/10/2000	1000000031
Accession 1000000032	10/10/2000	1000000032
Accession 1000000033	10/10/2000	1000000033
Accession 1000000034	10/10/2000	1000000034
Accession 1000000035	10/10/2000	1000000035
Accession 1000000036	10/10/2000	1000000036
Accession 1000000037	10/10/2000	1000000037
Accession 1000000038	10/10/2000	1000000038
Accession 1000000039	10/10/2000	1000000039
Accession 1000000040	10/10/2000	1000000040
Accession 1000000041	10/10/2000	1000000041
Accession 1000000042	10/10/2000	1000000042
Accession 1000000043	10/10/2000	1000000043
Accession 1000000044	10/10/2000	1000000044
Accession 1000000045	10/10/2000	1000000045
Accession 1000000046	10/10/2000	1000000046
Accession 1000000047	10/10/2000	1000000047
Accession 1000000048	10/10/2000	1000000048
Accession 1000000049	10/10/2000	1000000049
Accession 1000000050	10/10/2000	1000000050
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Accession 1000000059	10/10/2000	1000000059
Accession 1000000060	10/10/2000	1000000060
Accession 1000000061	10/10/2000	1000000061
Accession 1000000062	10/10/2000	1000000062
Accession 1000000063	10/10/2000	1000000063
Accession 1000000064	10/10/2000	1000000064
Accession 1000000065	10/10/2000	1000000065
Accession 1000000066	10/10/2000	1000000066
Accession 1000000067	10/10/2000	1000000067
Accession 1000000068	10/10/2000	1000000068
Accession 1000000069	10/10/2000	1000

NOTE: CONGRUITY: $\chi^2(1) = 1.00$, $p = .32$. **RELATIONSHIP:** $\chi^2(1) = 1.00$, $p = .32$.

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This month, David Crisp gets down to business with Vizatar, Help and Superhelp.

HELP/SUPERHELP
STACK: 100
\$19.00/\$25.00
Commodore 64

HELP AND SUPERHELP ARE A PAIR OF programmers and cartridges. They are both basically the same and except that the SUPERHELP cartridge contains a few extra commands as well as a two page assembler. Stack 100 split the cartridges up into four parts in the case of Superhelp and three parts for Help.

Part 1

Part 1 contains additional BASIC commands.

HELP. This command will display the last line carried out after an interrupt. In some cases it is not very reliable.

FPED. This will allow you to get a list of all the lines in which you have used a particular string variable or command word. I often use this when I have used variable names twice.

DELET. This is a line Delete using standard TD+BCMD syntax. It works reliably and is very important if you remember set substitution.

GINLIN. Most people know this function as AUTO. It produces line numbers automatically when writing a program. You can indicate the starting line number and the increment. I find this a useful time saver.

TRACE. Almost vital for those of us who were slightly less than perfect programs. This enables you to STOP through a program, line by line, so that you can see where things went wrong.

SINGLE STOP. As TRACE but the program only goes to the next line after a keypress. A sort of IN DEPTH trace.

END. This command stops programs of trace and stop.

ETHAMBE. One of the few commands I have come across that works well and reliably. It could not make it reliable and, best of all, it copes with GOSOS and GOSBS.

VARIABLE DUMP. Particularly useful DUMP of the current values and names of all variables used in a program.

BUSINESS

BUSINESS FILE



MATRIX DUMP. Same as variable dump but dumps arrays.

PAGE LIST. This allows you to set PAGES for listing. It enables you not only to have DOWM a listing but also back up. Very useful although LINE EDITING is not possible without killing the page effect.

HEX'DE' CONVERSION. This converts HEXADECIMAL to DECIMAL.

FILE OPENING. The "Y" key enables you to open a numbered output file without the usual nightmare.

SET. This full command MOFT SWITCHES off the cartridge.

COMPACT. (SUPERHELP) This command increases the possible density of a single

line to 240. It is quite useful but makes line editing virtually impossible.

UNDEFINED. (SUPERHELP) Check to see if there are any undefined line codes in a program. Works well and almost a must before radical renumbering.

HEX. This is used in the even shorter command "W". I can not say that it is really needed.

Part 2

This part is a disassembler/monitor. The disassembler is very good and easy to use. It is easy to modify the contents of addresses in hex and the display was clear that I have used it as a teaching aid. It can be have used it as a teaching aid. It can be



used to move blocks of data around in memory but the documentation for this isn't very easy. The monitor is not in the Commodore style and some of its uses are not very obvious.

Part 3

Part 3 is a DOS SUPPORT SECTION. It gives the 44 names of the disc handling commands that Commodore built into the making it easier to get a directory of the disc, open and close files, read channels, save, load and verify.

Part 4

This is a two page assembly for use with MURPHUP only. If I had seen this as a move to assembly language I would have said a mile. It is a two page assembly and is such it shows the source program on the disc for reading during the programme, so it can only be used with a disc drive. The documentation is not very clear or comprehensive.

In use

The additional BASIC commands are the most useful part of the program. They allow well although a couple of them seem a little pointless. The monitor menu title confusing at first and will not be quite what some people expect. But, all in all, these two cartridges are a good buy with a good balance of commands.

VIDEACAT
VIZA SOFTWARE (LIMITED)
994 91
Commodore 14

VIDEACAT IS AVAILABLE IN VARIOUS configurations of Disc/Commodore, including part Commodore and part 14.

The manual is thick, readable and likely well laid out. It is split into three sections. Section one deals with the spreadsheet part of VIDEACAT as that is what initially appears on screen. Section two deals with the database part of the program and section three deals with the navigation of the first two parts.

On screen

When the cartridge is on power-up you are invited to press the space key to load the rest of the program from disc. Within seconds an intro screen appears. I found it necessary first as a trial of the C14 type held on the disc.

The initial colours are very good irrespective of whether you are using a colour screen or a green screen monitor and, with the adjust keypad, the information is easy to read. You also have the option to change colours.

When the software has loaded you are presented with a special spreadsheet. Lines up and down the screen move 'beeping' in on a particular cell very easy, and whereas with most spreadsheets the active cell is highlighted by being inverse, in the case of VIDEACAT a small arrow points to the relevant cell. I have never seen a spreadsheet display quite the same as this before on the Commodore and it is both very efficient and professional look to it.

Initially the screen remains fairly uncluttered, with little information about options displayed. But with one press of the C140 key, a larger panel saying 'MENU' appears superimposed on the spreadsheet. A broad menu is displayed on the top line this covers options such as CELL, SHEET, FILE, PRINTER, GRAPH and DATE. Below this is a sub-menu showing further options which will be available if you choose a particular option. (For example choosing CELL gives you a sub-menu containing options to format cells, move etc.) Choosing one of these latter options in many cases gives you another sub-menu. This multi-layer menu-system is easy to use, very simple and enhances the program.

Entered in

I felt that the best use for the spreadsheet part of the program was to copy data from the spreadsheet I currently use into this one. I entered data into the sheet quickly and accurately. Because of the well laid out menu options I rarely had to refer back to the manual. It is not necessary to cover all the available commands. It would be confusing for people who have not used a spreadsheet before and repetitive reading for those who have. There are no glaring omissions on the sheet and all the standard functions such as replace, format, move etc more there. It was possible to produce line, bar and modular graphs and pie charts (even figures on the sheet. This is the most comprehensive use of graph facilities I have seen on a sheet. The chart production is easy and well documented.

Windows can be set up on the sheet which facilitates comparing several pages and using windows and graphs. A very comprehensive and easy to read summary could be prepared. One interesting thing about the graph function is that you move about the sheet and change figures the graph also changes. Admittedly this function does more things up a little.

Hardcopy

Using the options it was possible to find a way of obtaining a printout with more printers. If your printer is capable it is possible to get a screen dump of graphs etc. Manual routines are used for getting

printout of figures and data and through the printed menu it is possible to indicate whether you have Commodore/non-Commodore printer, single sheet or multi-leaf paper etc. It is not possible to get any details but of which printers work but I used a HP-1000 C1400A 14, a Minolta CPM and a COMPAQ386000 APRINT. All performed well.

Even more

As a spreadsheet this is more than. As a combined spreadsheet and database it is positively amazing. Using special commands available from the menu it is possible to get from the spreadsheet into the database. There is full integration between the two and the personal to program the whole setup makes the writing of applications possible. Basically if you have an invoice and statements routine set up on the database it is easy to store the information on the spreadsheet. If you have used a database management system before you will have had an idea of what this integration is about. Writing a program to produce a running application through is rather different and requires a lot of re-learning. But it is well worth the trouble.

Auto demo

The demo routine on the disc makes everything far clearer than I even could on a system. It runs for ten minutes and shows how much integration there can be between the database and the spreadsheet. There is a demonstration window routine which could be coded out to produce a fully blown application but it's main use is as a tutorial. The main commands, and how to use them, are explained in the demo. At first glance it seems head boggling but, after working through the examples a couple of times, becomes much clearer. Qualitative hard work and concentration is needed to program the database.

Worth the effort

Although it will take a long time to become proficient at using this to its full extent all I am recommended to persevere with it. If you use a spreadsheet and a database or if you think you are likely to the future then bear this one in mind. As a stand alone spreadsheet it would require expensive but even if that was all it did I would still consider buying it. As a combined package I think it is very reasonably priced. As a stand alone database it does not appear to be as powerful as some of the dedicated packages, but if you require a database which is linked towards storage and use of numeric data this would be a very good choice.

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Alison Hjel has braved the streets of Shrew and visited the Micro Computer Centre and its staff.

COMPUTERS IN BUSINESS

IN PURSUIT OF A TARGET for the export of a high street Commodore dealer, I had to look no further than the local Micro Computer Centre. I sympathised with Mr. Grant and his staff for, like myself, they are beset with the dubious privilege of a situation by Maritime station and constant competition with the Waterloo to Richmond 'express'.

Phil Grant, the Micro Computer Centre's manager, with 20 years' computing experience to his name, has been running this company for 8 years which makes it one of the oldest micro computer companies around in fact, when the company was founded, Commodore were concerned merely of a small office with a staff of four.



Small is beautiful

The Micro Computer Centre can hold the advice of a young engineer responsible for its birth. As a micro computer consultant on the verge of buying a new micro, Mr Grant was prompted, by the engineers helping him to transport his new purchase, to cross the street from main to micro. Then, he was told, by the future, Mr. Grant, about somewhat ignorant of micro at the time, made the crucial move of breaking across to Commodore at Easton where he purchased a 2000 series Commodore micro computer. He never looked back. Within three months, his micro was achieving all he needed from a computer.

Having acquired four Commodore micros, he opened a small store with a notice kindly implanted in

his window inviting passers-by to 'come in and play games' on his new micro. But this was merely a ploy to attract customers. Mr. Grant really had his eye to the business market and let us know that business applications were also available. As is still the case in high street computer stores, all over the country, Saturday mornings would see an infiltration of 'piece-of-iron computer buff's' implanting their sticky fingers on Mr Grant's keyboards — but help was at hand, excepting their slipping to the Commodore Haven in darkest Shrew were their fathers — several managers of small businesses. One by one, bound with little Jimmy's promise of tapping secreted treasures from outer space, they approached Mr. Grant seeking solutions to their various business problems.

Mr. Grant's ability to prove to them that a computer could solve their problems resulted in an influx of orders and an escalation of business. And that, the Micro Computer Centre was born.

Soft-centred hardware store

Mr Grant's store is not merely a hardware retail outlet. Apart from the computers themselves, and various peripherals, the Micro Computer Centre offers a comprehensive range of business applications software — both in the shape of off-the-shelf packages and software generated by its own highly experienced programming staff. Mr Grant states that "A large part of the company's success stems from writing our own software". When asked

what sort of software they produce and for whom they cater, Mr Grant recently replied: "Small applications for large businesses and large applications for small businesses". He means that, in offering their own custom software, they are not out to exploit customers. If there is already something available on the market that will meet the customer's needs, Mr Grant will suggest he buys it. If not, the Micro Computer Centre's programming team will try to produce a piece of software suitable.

The Micro Computer Centre's success, so Mr Grant claims, lies in its emphasis on service rather than hard selling. He sees his company as a consultancy first and foremost: full support — training, maintenance, etc. — is offered with all hardware and software sold. They have never advertised and



only recently employed a small sales force. Most sales come via personal recommendations.

The Micro Computer Centre's best selling product is their home-produced "Office Mate", a fully integrated, modular office system containing, amongst other facilities, a purchase ledger, nominal ledger, sales ledger, cash book and stock control and, probably the greatest point in its favour, 385 modules which account for its flexibility. Mr Grant claims that their "star performer" not only appeals to the customer rather than expecting the customer to adjust accordingly, but is also cheaper than its immediate competition.

I shall show by way of a couple of examples that the Micro Computer Centre, far from being mere high street traders, are also experts in the field of software development.

Take on a mainframe system. The marketing personnel visited Mr Grant on a Thursday, a skeleton of the program was ready the following Tuesday. The final result was an analysis of work for over 27,000 doctors moved into a Commodore 8000. "They said we couldn't do it", he boasted.

Featured recently on the BBC's series, "Their Life in Your Hands", was a program on research into cancer in women by the Institute of Obstetrics and Gynaecology at Hammersmith Hospital. With the assistance of Mr Grant and his team, statistics of hundreds of thousands of women have been stored on an 8002 Commodore with a 384 hard disc.

Why Commodore?

Lent recently, the only hardware stocked by the Micro Computer Centre was Commodore beam and

his sense of confidence. However, so far as sales of business machines are concerned, the immediate past has been a far cry from Commodore's initial success.

Mr Grant has strong views on Commodore's relative collapse in this field. He says of the 8000 series: "It was a very successful machine which led the market by far but someone earlier Commodore had disbanded its R & D". He states that Commodore's designer, Chuck Peddle, went to Vector and designed Sinix; this should have been a Commodore machine".

He believes that had Commodore's newest baby, the 8290, been released in place of the somewhat disastrous 700 series, Commodore may well now hold the status in the business market which they deserve.

in with a bang". Commodore's reputation as home computers due to the resounding success of the C64 64 has cost them some credibility in the business stakes. But Mr Grant is convinced that: "The business market is going to be bigger than the home-computer market". He believes that any machine which hopes to corner at least part of the business market needs to be IBM compatible due to IBM's dominance of the market with their PC.

Anyway, Commodore's price and promotion tactics will be right, he thinks, and as to the product itself. "I think the product will be good this time, although he could be pure optimism". But he has confidence in Commodore's vastly improved production facilities and new teams at work in Germany and the UK. With technical people of a different calibre now, there is every reason to believe that the product will be good.

There is a place for the Commodore. If you look at the micro-computers overall in the market... at the bottom end of the range there is no computer to compare with it."

So his predictions for '85 (in the various price categories) "Commodore at the bottom, Amstrad in the middle and IBM at the top. I can't see anybody else getting a look in — I could be proved wrong".



When some marketing personnel from a multinational drug company, having introduced a new product, asked Mr Grant for some help in analysing the state of their representatives to doctors he was true to his word that his staff could do the job more efficiently than the 6-8 months it would

be. So why the initial choice of Commodore and why the recent digression?

When Mr Grant first took his giant step into the micro computer field, he believed that the only viable comparison to Commodore was Apple. And Commodore, being cheaper, more flexible and more first-hand user oriented, got

End of the tunnel

But, although sales of Commodore machines at the Micro Computer Centre have dropped, Mr Grant holds out a lot of hope for Commodore's return to the forefront of the business market. "I think they will come back early in '85 and when they do they'll come

Calling Commodore Retailers

If you own a small computer business or store where the emphasis is on Commodore machines or software, or if you know of anybody out there spreading the good name of Commodore through their trade, please let us know if you think they should be mentioned in Your Commodore.

BAND-AIDS



Chris Palmer gets stuck in to two music packages. Join him at the keyboard.

THERE CAN BE NO DOUBT THAT THE 64 best use of the most powerful personal sound chips around. However, anyone who has delved into the workings of the 180 chip will realize that no fiasco is ever won easily. That leaves the way open for software writers to help the user out over 512. The two products we are looking at in this review exhibit two different ways of leading you towards a common goal. That is, making music on the 64, with the rich tone of bus.

One sounds and the other for a, for the answer to this and other burning questions, read on!

Microsound 64

The Microsound package comprises a full size piano style keyboard, a tape or disc containing the driver software and a typewritten manual. This keyboard came as a very pleasant surprise for me, because this sort of system will be let down by

forcing you to play on a 'Miles Moore' keyboard. It has a span of a full four octaves and a curved in hand, black, ABS Plastic.

To the left of the keys are two sliders. They allow you to change certain variable components of the sound by moving them, hence though this, but why are they so stiff! On larger synthesizers the sort of arrangement is used to let the player put extensions into a piece of music. To do this, the sliders have to be able to move under the slightest finger pressure to allow for both fast and subtle effects. Perhaps these sliders will assure up a bit after use, but that leads me to wonder how good the contact will be.

The keyboard connects to the 64 through the two joystick ports. Once inside the machine can be turned on and immediately loaded. After selecting either disc or tape mode you are passed to the main screen.

It is from this screen that the majority of the sound creation and play characteristics are set up and altered. The bottom left part of the screen is devoted to the attack, decay, sustain and release levels for each of the three voices. The top of the screen shows which waveforms are active for the voices, along with filter routing, sync and ring modulation. The

screen is controlled by a five status display and control key menu.

From this screen you can pass to menus which control tuning, positioning and the sequencer. But, back to the main screen.

On power-up, the keyboard is set to Monophonic mode with a fairly sharp frequency. You can set the keyboard to polyphonic mode by toggling the "T" key. Because the dd has only three oscillators, the polyphonic mode only lets you play three notes at a time. The software sequencing of the keyboard seems to be a little slow, which makes fast playing a bit bit and miss. The quality of the sound depends very much on what output you're using. Through a TiE speaker, even the best sounds seem rough, so putting the whole lot through a Hi-Fi improves things greatly.

Much as I admired the thought and sentiments behind the Microsound dd, I could find very little to praise since I started to use it. For a start the manual is appalling! Even with my knowledge of synthesizers I found it quite tricky to understand the way some of the more advanced features worked. Contrasting an inexperienced user with phrases like 'The instantaneous nature of the output of oscillator A results in the pulse width' without any further explanation, is incredible.

Matters would have been helped if the disc contained some other sample sounds that could be loaded and recorded. The manual didn't even show any example patches to play about with.



The software was too slow to respond to the sound editing commands and I often found myself 'typing ahead', only to find that inadvertently changed the wrong parameter and ruined the sound I was trying to create.

One of the most useful features of any sound program of this sort has got to be the sequencer. Unfortunately, the Microsound sequencer was little better than the main part of the software. The most disturbing thing about it, was that you could get in, but you couldn't get out. That's right, the only way I found I could get back to the main menu was to finish the program and RLL it again. Of course by doing this, you lose the sound you had created in the main menu, unless, of

course, you had the foresight to save it. Even so, this is TOS and software is supposed to be friendly, isn't it?

The sequencer will let you go 'over' three parts on top of one another and then play it back in unison. Sequences can be edited by running a cursor back to the relevant point and either deleting the note or playing the correct one over the top. Once you are happy with a sequence you can save it to your storage medium.

Despite my doubts about this system, it does have some saving graces. If you want to find out how a continuous generator and controls sound, and are willing to persevere with your ears, then the Microsound dd could give you a lot of enjoyment. But if you expect to be able to sit down and play like Howard Jones or Rick Wakeman, then I don't think that the Microsound is for you.

There is one interesting development waiting on the horizon that could turn the Microsound into a very attractive proposition for any amateur musician. On the back of the keyboard there is a Duetty D-type connector which is set aside for external triggering and signal sampling. Now, if Autogators can make a digital sampling add-on cheap enough, then I think the Microsound dd become a popular addition to the set up of those of us who share late into the night creative moments in our home studios.

Music Maker

It might seem strange to some people that having been slightly less than



complementary about the Microboard kit with its proper keyboard, I am about to start trying about a system which can what can only be described as a "Money Amount" keyboard. The article in question is, of course, the plastic keyboard overlay which is supplied with Commodore's Money Maker package. In my that I wouldn't look out of place being glad my first with a packet of confetti, not about some, I can.

In manner of operation is simple. The actual keyboard part of the unit is contained within a tough vinyl surround which houses the body of the kit. When you press a key on the master keypad, a return spring a key on the alphanumeric keyboard underneath. Now I must admit, when I can accept the in the PC-W show, I discovered it is being too early to be of any real worth. But when you actually come to use it, you soon notice it works, and very well at that. You haven't got the potential available that a full size keyboard offers you, but it is ideal for kids and anyone who hasn't progressed beyond the one finger stage.

The reason for such harsh and shallow abuse of the instrument is in the interpretation of the software. Each of the means, principally means, are clearly laid out, so it's virtually impossible not to know what you are doing. The software also concentrates on getting people playing things as soon as possible, rather than changing them in at the deep end, with each piece then going to use them as it



The rest of the package also reflects the approach. As well as a very clear exercise manual, you also get an "easy-play" song book. Contained in this are such classics as "Here's a Song", "The Under Song" and the sing-along age "When I'm 64". There is even a sheet of stickers with which you can plaster the husband of your love trouble husband.

References

Along with the tunes for you to input yourself, the disc (or tape) also contains "When I Need", "Georgia" and the "Snow Patrol". All of which can be listened and played immediately.

Topic: *Business mathematics*

As I used said, it is the software which really makes this package stand out. Everything is menu driven and for the most part, uses the function keys to select an option.

Our softest feature: your 64 key voice prompts in a Casio-type keyboard. Along with the music voices from the keyboard, you are also offered an auto bass system and a choice of three drum patterns.

On power up, the software displays eight pre-defined waves, all of which are quite usable. If you want to change the waves you can do so to a set menu where the second parameters are displayed for you. As long as to store and load the wave data is not provided, so it is possible to build up your own menu of waveforms. The manual also gives a table of values to provide a starting point for your own calculations.

The software also gives you the choice between monophonic and polyphonic play. Which, when you think about it, is no mean feat, considering that the Commodore keyboard can't supposedly be able to be scanned that way. Funest way to say, the authors are very pleased with themselves for doing this and unfortunately they wouldn't part with the

The successful part of the program is split into two parts. First, you input the notes by pressing the keys on the keyboard. The notes you press are highlighted on a keyboard representation on the screen. You shouldn't worry about the timing of the press in this method, but this is the function of the second part. When you have completed this task in your satisfaction, you then input the information for the timing of the press by simply tapping on any key. The computer then starts to deal along with the notes you have finished, tapping the key again will play back the notes with the volume you set in the second time.

All told I found it a pleasure to work with the Music Maker package, despite the limitations imposed by the keyboard. The only depressing fact is that you can already buy up good books to complement the system, featuring the works of Durer, Cezanne, Van Gogh, Jackson and the like. No doubt in comparison these in cases we will not be able to escape the status of "Tudor" and "Roc". To confirm this, I already work on some interesting editions of Emerson, Lake and Palmer's music, successfully convincing me just that persons, for hard work.



Garry Marshall puts
your programming
 prowess to the test in
 this new series for the
 CSM 64.

PROGRAMMING PROJECTS



THIS NEW SERIES WILL present a programming project in the form of a problem to be tackled with the aid of the computer. The projects have been devised not only to call on programming techniques that are interesting in a general way, but also to show off the best features of the 64. Graphics, sound production and sprites will be prominently featured. Some of the programs that are necessary to carry out the project will be developed. The intention is to introduce some methods for solving problems, to introduce some useful programming techniques, and to lead you into further explorations associated with the project and with the 64.

We begin this month with a 'turtle chase'.

The Project

There are n number, N , of turtles on a floor. They are numbered from 1 to N . Their positions can be stored by placing the X - and Y -coordinates of each in the relevant elements of arrays named X and Y . The turtles move so that each pair are the same time twice: Y pursues turtle 2, turtle 2 pursues turtle 3, and so on, with turtle N pursuing turtle 1. They all head directly towards the turtle that they are pursuing, and they all move at the same time. This situation is easily conveniently simulated by listing all the turtles move at discrete instants, as on the ticks of a clock. At each instant, every turtle moves a fixed distance towards the position occupied by the turtle that it is pursuing. Figure 1 shows the first few movements for a group of five turtles.

The program should begin by accepting a value for the number of turtles, N , then allocate their initial positions,

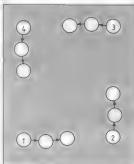


Figure 1. Initial steps for 4 turtles

but symmetric patterns will result if the turtles are systematically placed, perhaps in positions that are equally spaced around a circle.

The solution

Because the turtles all move at the same time, we shall not use Y to read the arrays X and Y to hold the current positions of the turtles, but also two further arrays to hold the positions to which they move to at each instant in the simulation. If we do not use a second pair of arrays, but correctly update the arrays holding the current positions with new positions then some of the turtles will not head for the correct positions when they move. This would mean that we should not be

simulating faithfully the situation in which all the turtles move simultaneously. It is also convenient to give X and Y a dimension of $N+1$, for then the contents of the last elements of the arrays X and Y can be copied into the X and Y of turtle N chasing turtle 1 can be dealt with in the same way as all the others.

Figure 1 shows, albeit insufficient to show that all the turtles will spiral in towards each other as they move. It is not easy to

see, then carry out a few more steps with a pencil and paper simulation.) Starting the turtles off from positions that are equally spaced round a circle gives a neat symmetrical pattern for their paths, but if you are not particularly worried about neat effects, any starting positions will do, and the result will not be a pattern of spirals. In our program, the turtles are spaced around a circle with its centre at the centre of the screen and having a radius of 50 slots. This gives us the first part of the program for accepting the number of turtles and for setting up their initial positions (see below).

The gap between lines 60 and 118 will be filled in a moment.

We can now write the program (highlight for comparing the two move positions of the turtles. The gaps to be taken by a turtle towards the turtle it is pursuing are five screen dimensions in length. The new position for the pursuing turtle is calculated by adding the difference between the X -coordinates and the difference between the Y -coordinates for each turtle and to X and Y to get. The distance, D , between them can then be calculated by using Pythagoras' theorem.

The new program can then be calculated by reducing the differences in the X -coordinates and in the Y -coordinates in the same proportions so that the total change in distance is five. When all the new positions have been computed the X and

```
10 INPUT "NO. OF TURTLES",N
20 DIM X(N+1),Y(N+1),DX(N+1),DY(N+1)
30 FOR K=1 TO N
40   X(K)=50+50*COS(2*PI*(K-1)/N)
50   Y(K)=50+50*SIN(2*PI*(K-1)/N)
60   DX(K)=0
70   DY(K)=0
80   T=1
90   GOTO 110
110   T=T+1
120   T=T+1
```


Turtles can be updated with their values and then the process can be repeated. The program is stopped when the turtles are within two steps of each other (They cannot very well take a step towards each other if they are already closer than that). The instruction for stopping is written as
 760 IF D<5 THEN 780
 rather than as
 760 IF D<5 THEN STOP
 so that the display is redisplayed when the program fails. The program segment is

```
130 FOR L=1 TO H
140 B=POKE(3)+1:Y1=L-1+L*(H-1)
1:0 I=0:PA=140
150 IF D<5 THEN 180
160 J=1:J1=L-1+L*(H-1)+1
170 WHILE J1<H+1:J2=H+1-J1
210 NEXT J1
220 FOR K=1 TO A
230 X1=X+D*(J1-J2)/A:Y1=Y+D*(J1-J2)/A
240 GOTO 1
```

Now, although these program segments carry out the simulation, they are not very exciting in themselves. By adding some graphics to the display the current positions of the turtles and the paths that they take building up as they approach each other.

The first steps that are necessary before any graphics can be displayed are to set the bit to its bit-mapped high-resolution graphics mode, to position the bit-mapped display in the memory, and then to clear it and set its foreground and background colours. This is done by placing the following lines in the gap we left earlier:

```
0: LINE SCREEN:PEEK 510=0:LO 0
20: CL=0:PEEK 510=0:LO 0
A: L=1:J=1:J1=1:J2=H+1-J1
130 FOR I=1:LO 1:DO 240:PA=1:GOTO 1
```

The position of a turtle can be shown by plotting a point at its current position. A single dot can be plotted in row B and column C by

```
100: L=1:PA=1
110: L=1:PA=1
120: L=1:PA=1:GOTO 1
130: L=1:PA=1:GOTO 1
140: L=1:PA=1:GOTO 1
150: L=1:PA=1:GOTO 1
```

Putting all this together gives us the following complete program. We have added lines 130 to 140 in context, so that, each of the turtle positions to the lines required by the plotting subroutines, and then to call the subroutines itself. Line 250 is also added so that as soon as an exit of positions is plotted, the program goes back to line 130 to compute the next position and to plot them.

When this program is run, it

first asks for the number of turtles. When this number has been entered, the program then takes a minute or two to set the high-resolution mode and to clear the relevant section of memory. You can 'see' this happening on the screen, but do be patient.

The display produced by this program for H=5 is shown in Figure 2. If the stopping condition is removed by changing line 760, some quite spectacular effects are produced. The effect results from the turtles oscillating about each other when they are closer than five dots as they continuously pass each other.

Further developments

The program that is developed here contains the essence of

```
10 INPUT "NO. OF TURTLES";H
20 DIM X(H+1),Y(H+1),D(H+1),Y(H+1)
30 FOR I=1 TO H
40 X(I)=120+50*COS(510+20139*H/4)
50 Y(I)=100+50*SIN(510+20139*H/4)
60 NEXT I
70 POKE 510:PEEK(510)=20139:H=0
80 POKE 510:PEEK(510)=0:H=1
90 FOR I=1:DO 130:DO 140:DO 150:DO 160:DO 170:DO 180:DO 190:DO 200:DO 210:DO 220:DO 230:DO 240:DO 250:DO 260:DO 270:DO 280:DO 290:DO 300:DO 310:DO 320:DO 330:DO 340:DO 350:DO 360:DO 370:DO 380:DO 390:DO 400:DO 410:DO 420:DO 430:DO 440:DO 450:DO 460:DO 470:DO 480:DO 490:DO 500:DO 510:DO 520:DO 530:DO 540:DO 550:DO 560:DO 570:DO 580:DO 590:DO 600:DO 610:DO 620:DO 630:DO 640:DO 650:DO 660:DO 670:DO 680:DO 690:DO 700:DO 710:DO 720:DO 730:DO 740:DO 750:DO 760:DO 770:DO 780:DO 790:DO 800:DO 810:DO 820:DO 830:DO 840:DO 850:DO 860:DO 870:DO 880:DO 890:DO 900:DO 910:DO 920:DO 930:DO 940:DO 950:DO 960:DO 970:DO 980:DO 990:DO 1000:DO 1010:DO 1020:DO 1030:DO 1040:DO 1050:DO 1060:DO 1070:DO 1080:DO 1090:DO 1100:DO 1110:DO 1120:DO 1130:DO 1140:DO 1150:DO 1160:DO 1170:DO 1180:DO 1190:DO 1200:DO 1210:DO 1220:DO 1230:DO 1240:DO 1250:DO 1260:DO 1270:DO 1280:DO 1290:DO 1300:DO 1310:DO 1320:DO 1330:DO 1340:DO 1350:DO 1360:DO 1370:DO 1380:DO 1390:DO 1400:DO 1410:DO 1420:DO 1430:DO 1440:DO 1450:DO 1460:DO 1470:DO 1480:DO 1490:DO 1500:DO 1510:DO 1520:DO 1530:DO 1540:DO 1550:DO 1560:DO 1570:DO 1580:DO 1590:DO 1600:DO 1610:DO 1620:DO 1630:DO 1640:DO 1650:DO 1660:DO 1670:DO 1680:DO 1690:DO 1700:DO 1710:DO 1720:DO 1730:DO 1740:DO 1750:DO 1760:DO 1770:DO 1780:DO 1790:DO 1800:DO 1810:DO 1820:DO 1830:DO 1840:DO 1850:DO 1860:DO 1870:DO 1880:DO 1890:DO 1900:DO 1910:DO 1920:DO 1930:DO 1940:DO 1950:DO 1960:DO 1970:DO 1980:DO 1990:DO 2000:DO 2010:DO 2020:DO 2030:DO 2040:DO 2050:DO 2060:DO 2070:DO 2080:DO 2090:DO 2100:DO 2110:DO 2120:DO 2130:DO 2140:DO 2150:DO 2160:DO 2170:DO 2180:DO 2190:DO 2200:DO 2210:DO 2220:DO 2230:DO 2240:DO 2250:DO 2260:DO 2270:DO 2280:DO 2290:DO 2300:DO 2310:DO 2320:DO 2330:DO 2340:DO 2350:DO 2360:DO 2370:DO 2380:DO 2390:DO 2400:DO 2410:DO 2420:DO 2430:DO 2440:DO 2450:DO 2460:DO 2470:DO 2480:DO 2490:DO 2500:DO 2510:DO 2520:DO 2530:DO 2540:DO 2550:DO 2560:DO 2570:DO 2580:DO 2590:DO 2600:DO 2610:DO 2620:DO 2630:DO 2640:DO 2650:DO 2660:DO 2670:DO 2680:DO 2690:DO 2700:DO 2710:DO 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1397:DO 1398:DO 1399:DO 1400:DO 1401:DO 1402:DO 1403:DO 1404:DO 1405:DO 1406:DO 1407:DO 1408:DO 1409:DO 1410:DO 1411:DO 1412:DO 1413:DO 1414:DO 1415:DO 1416:DO 1417:DO 1418:DO 1419:DO 1420:DO 1421:DO 1422:DO 1423:DO 1424:DO 1425:DO 1426:DO 1427:DO 1428:DO 1429:DO 1430:DO 1431:DO 1432:DO 1433:DO 1434:DO 1435:DO 1436:DO 1437:DO 1438:DO 1439:DO 1440:DO 1441:DO 1442:DO 1443:DO 1444:DO 1445:DO 1446:DO 1447:DO 1448:DO 1449:DO 1450:DO 1451:DO 1452:DO 1453:DO 1454:DO 1455:DO 1456:DO 1457:DO 1458:DO 1459:DO 1460:DO 1461:DO 1462:DO 1463:DO 1464:DO 1465:DO 1466:DO 1467:DO 1468:DO 1469:DO 1470:DO 1471:DO 1472:DO 1473:DO 1474:DO 1475:DO 1476:DO 1477:DO 1478:DO 1479:DO 1480:DO 1481:DO 1482:DO 1483:DO 1484:DO 1485:DO 1486:DO 1487:DO 1488:DO 1489:DO 1490:DO 1491:DO 1492:DO 1493:DO 1494:DO 1495:DO 1496:DO 1497:DO 1498:DO 1499:DO 1500:DO 1501:DO 1502:DO 1503:DO 1504:DO 1505:DO 1506:DO 1507:DO 1508:DO 1509:DO 1510:DO 1511:DO 1512:DO 1513:DO 1514:DO 1515:DO 1516:DO 1517:DO 1518:DO 1519:DO 1520:DO 1521:DO 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Steve Ireland talks to his computer in Morse. And it talks back.

CALLING ALL COMMODORE 64 owners. If you are an amateur radio enthusiast then an American company called ADA has just invented the computer game for you. It's called Doctor DS and comes in the form of a cartridge which plugs into the expansion port of the 64.

Around the world

Let me explain a little of the background to the game for those of you not familiar with the world of amateur radio. During the course of a year there are a number of contests for radio-amateurs who know (CW = Morse) to the microphone — operators on the shortwaves. These are worldwide events and stations from Boston to Bangkok, Newbridge to Tokyo and Sheffield to Sydney will participate. The idea of the contest is to contact as many stations as possible in as many countries as you can find over a twenty-four hour period. Radio amateurs will huge areas and go to 'rare' yet rarely-operated transmitters in order to win these contests and the fame and funds which accompanies them. Many of them also spend large sums of money in these endeavours.

If you don't have a huge aerial and can't afford the solar iono for info, you can still use up a prize-winning station and a contest to go with it simply by playing a Doctor DS into your 64.

On screen

Once it's up and running, a graphic representation of a radio transmitter and receiver appears on the screen. The transmitter covers the so-called amateur wavebands. There is a phoria counter at the back into which you must plug either a hand key or an electronic keyer in order to transmit your Morse 'messages'. Having done this, you are alerted to enter your chosen latitude and longitude co-ordinates. You may operate from any country in the world and the time in GMT at which you wish to say it. Then, on pressing RETURN on the 64, Doctor DS proceeds to simulate suitable radio conditions for your location over a 24 hour period.

Wave forms

Radio conditions vary a lot over a 24-hour period depending on where you are in the world and the time of day. This is because of the varying conditions of the

ON THE AIR



atmosphere. Long distance shortwave communications rely on the reflection of radio waves by the ionosphere. To do this, the ionosphere needs to be ionised to a certain degree, depending on the frequency of the radio waves, and this ionisation is caused to some extent controllable by the position of the sun relative to the frequency. A little complicated, isn't it?

Well, within the task of SIMCOM memory in the Doctor DS, all of these factors are simulated. I found the simulation quite remarkable and fair based 'on-the-air' for some 20 years. Stations appear on the bands and can be communicated with and you can also overhear stations communicating with each other. All of this is just like real radioing: no. When you are operating in the lower band segments, the stations are stationary at much faster speeds and the operators are more posh-ed. This, too, is also often the case in real life.

Mastering Morse

Of course, the Doctor DS is designed for the specialist user; not everyone knows

Morse or wants to learn it. However, for the enthusiast it provides an excellent Morse trainer and anyone who wants to learn can use the Doctor DS, since they have reached about 5 words per minute. It also allows the rest of us to take part in competitions from anywhere in the world without spending a penny on award tickets or to 'hammer' with our other equipment than a Commodore 64.

So, if you've been simulating becoming a ham radio enthusiast but have been put off by the cost of the equipment then the Doctor DS will give you an idea of the excitement to be had from talking to the rest of the world. Of course, you have to have some means (perhaps first!) listing in front of the screen listening to the noise on the airwaves. It could be said that I was talking in circles on the other side of the world and not just to the computer. Surely there can be no better communication for a computer simulation than this.

Doctor DS costs £16.95 and is available from ICS Electronics, PO Box 2, Ayrville, West Sussex.

Steve Ireland is the editor of *Home Radio Today*.



Commodore's Plus/4 contains a suite of four programs. Does this make it a credible business machine? Bob Wallace answers this question.

PLUS/4 SOFTWARE QUARTET

As a PLUS/4 LIFE AND DEATH IN THE home micro market, there have been some huge success stories and some not-so-successful enough to bring tears to a CPU's eye. In a field with such a competitive spirit, all manufacturers are trying as hard as possible to make their machines as versatile and powerful as they can, while also keeping the price of the machine as low as possible.

Lately all extra packages for a home micro tend to be very expensive pieces of software. Now some of these packages come as standard, with at least one being incorporated in the more expensive video machines.

Not to be outdone by the rival Japanese machines, Commodore have pulled forth and produced probably the most advanced machine—the Plus/4.

It does not feature any software package, but a suite of four programs as standard: an IDEM, the package and a Word Processing package; a Commodore package; a Database system; a Business graphics package.

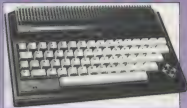
Word Processing

The first program to be dealt with is the Word Processing package. For those who are unfamiliar with such things, it is a program that allows the user to type out letters and documents directly to the TV or monitor screen, modify the text to a desired standard and then produce a hard copy printout via a printer.

Once a document has been printed the information can be stored on tape or disc for future use.

To enter the word processor, you just press the F4 key and start it. The computer keyboard is now acting as a typewriter keyboard, so what you type is what appears on the screen. The idea behind such a package is that errors are easy to correct. This is certainly the case on this program. Using the computer's edit and editing facilities, one can easily insert missing letters and delete letters that you have typed in wrongly.

The processor allows a maximum line length of 72 letters with auto wrap-around to prevent ugly words appearing at the end of lines. The 72 letters are fitted on to a 40-column screen by scrolling the screen to the left when the forty columns are



filled. This I found to be rather distracting when typing in large documents. One remedy would be an 80 column display, which is not possible at present on the Plus/4.

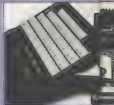
Having entered a document there are a host of at least commands. These enable the user to insert or delete lines, edit and move blocks of text around within the document, set page length and size. The very nice touch is the search and replace command which allows the user to search for a given string and change that string to another specified by the user.

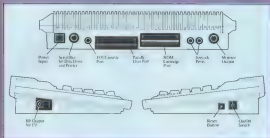
Other commands available to the user include the ability to set Tabs, Centre text on, Right justify text, Merge files, Load and save files to disc, all of which help to produce a professional looking document.

Having said that, the quality of the document is not finally decided by the processor, but by the printer. If a cheap Dot Matrix is used then a poor quality document will be the obvious result.

Commodore have tried to give the user as many commands as possible to ensure the easy use of the processor. As commands entered are by a simple command format. With a few days use

they should be easy to remember and they allow full use of the features available. In conclusion, I feel that the package has great potential for the small business user or club which needs fairly simple documents producing on a regular basis. If however you need to produce very lengthy documents, this processor is not ideally suited.





The Spreadsheet

At first, I thought that reviewing a spreadsheet would be about as unexciting as watching paint dry. I soon realised that the computer supplied by Commodore made entering data to the spreadsheet very simple and almost a pleasure.

What exactly is a spreadsheet? For me the question needed to be answered in one way only: What result is it for me?

It soon became apparent that if I was going to spend a lifetime entering data then my expense was significant. My way of doing it was simply to go through the manual and even get a new printout showing a world map in all 100s, 1000s, 10,000s, 100,000s and 1,000,000s. I did not need any more.

To enter a spreadsheet, all you need

only enter the address (row and column) of a command/ready type BC which means 'do calculations', and then you enter the spreadsheet. The spreadsheet is organised as 17 columns and 80 rows, of which only 10 columns and 10 rows are visible at the screen at any one time. To compensate for this a scrolling screen is used, as in the word processor.

The intersection of a row and column is called a cell and a large cursor block indicates the current cell location. By pressing F1 the cell is moved to the right, F2 moves the cell to the left. As the cells are 100 characters (padding) on along data, so you can have meaningful column headings on the final printout. Pages of data can be edited and inserted with a reasonable degree of ease. The entering of data is fairly straightforward and with a little practice, you should soon become

proficient at the spreadsheet, although printed copy.

The package also allows the use of formulae from within the spreadsheet, so that quite complex calculations such as interest rates and mortgage repayments can be calculated. The method of entering formulae is a little complex and needs some time before it is mastered. As with the word processor, any file that is created can be loaded or saved from disc. The obvious way to evaluate the uses of this package is to try it yourself and hopefully it will meet the standards you desire.

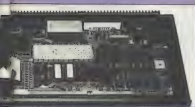
It is true that the package is only going to limit use to the small business or club which deals with limited financial transactions. In the average computer field, it may seem a bit of a waste of time to spend.

The Database

The uses of a database are only limited by the imagination. A good database will allow the user easily to store a given set of facts, and at a later date retrieve them for further use. Applications could include storing names and addresses, personal files, collections, recipes etc.

Under normal circumstances, one would probably keep this type of information in some type of card index system. The Hawk database puts an end to having to plough through endless card indexes to retrieve what you need.

To enter the database you first enter the word processor and type F1 + 80744. Before actually entering any data it is advisable to plan your file on paper first as this will speed up entry some





computer.

A database stores information in fields which you specify. Thus for a telephone directory, one might need 3 fields to cope with first and last names, address (two fields) and telephone number. The package allows up to 17 fields, each of which can contain 80 alphanumeric characters per field.

The maximum number of records per file is 998. This may be a little restrictive if the package were to be used, for example, by a school as a pupil database. Once you have defined your fields the entry of data is very simple and a mouse should have little or no problems with this aspect of the package.

As soon as the required data has been entered into the computer, several useful commands are available for the user to manipulate the data.

One of the best features of a database is its ability to sort data into a specified order, such as alphabetically, or numerically. This package allows this, but it uses memory occupied by any data left in the word processor so records should be increased when doing a sort.

The package allows the user to produce a printed report on the data which is stored in the database, but to do this requires the use of several screens from the keyboard. The number of user inputs could have been cut down a little and the hard work left to the computer.

If you do not require a printout of the data then the less commands used read frequently are **Review** and **Search**.

The **Review** command flips very quickly through the data stored starting at any specified record number. When the desired piece of information is in view, pressing **CONTROL** and **S** will freeze the display, pressing **RED**, **SH** squarables the screen.

If a full review is not wanted, one can enter the search mode where the computer will ask for a string or number to search for and then display all records that have that string or string in them.



This is a menu cursor command.

There is a bonus by the last package of the four offered by the Plus/4. If you have any kind of hobby or job that needs quick and easy access to information, then you need a database.

Business graphics package

This package is not really a separate program, but an extension of the spreadsheet. It enables the user to output numerical information in graphic format.

I was somewhat disappointed to find that even though the Plus/4 has extensive bit line graphic capabilities, they are not used in this program. The reason is that the characters must be printable by a Commodore printer, hence even very cheap printers have dot programmable characters. I feel that the reason is a little weak.

The entry of data is very straightforward, and a nice touch is that the package has an auto scaling function which keeps the graphs to a readable size.

The graphics can be dumped to a printer and added to any document or spreadsheet. The quality of the graphs is not as good as it would be in bit line, but one good graph is better than no graph at all.

Bar graphs and point graphs are entered first, though the bar graphs are more pleasant to look at.

All four

Commodore have produced a relatively cheap menu with a lot of the facilities normally found on much more expensive machines. However, the packages offered are probably only useful to a limited number of people. If you are considering buying a Plus/4 for the business software market, then that it will cope with all the tasks you want to perform, not just now but also in the foreseeable future. Otherwise you may be frustrated by its limitations.

However, within those limitations the Plus/4 and its software are fairly successful packages in which I would offer a qualified welcome.



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1. Introduzione	Definizione di...
2. Teoria
3. Applicazioni
4. Conclusioni
5. Bibliografia
6. Note
7. Commenti
8. Altre informazioni
9. Riepilogo
10. Conclusione

Region	Population	Area	Population Density	Population Growth	Population Change
North America	300,000,000	24,709,000 km ²	12.1	0.9%	2,700,000
Europe	720,000,000	10,180,000 km ²	70.7	0.7%	5,040,000
Asia	3,600,000,000	44,579,000 km ²	80.8	1.2%	43,200,000
Africa	600,000,000	30,370,000 km ²	19.8	2.5%	15,000,000
South America	300,000,000	17,840,000 km ²	16.8	1.5%	4,500,000
Oceania	30,000,000	10,280,000 km ²	2.9	1.0%	300,000

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Keywords: *children, adolescents, parents, family, social support, self-esteem, coping, resilience, mental health, well-being*

[illegible]

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Alice

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PURE MAGIC!

Join Alice in her journey through Videoland - an enchanted place populated by strange creatures such as bread-and-butterflies and pipe smoking caterpillars, where little girls change size and flamingos turn into croquet mallets!

Alice in Videoland is a revolutionary new concept in entertainment for the Commodore 64, incorporating some of the finest graphics ever seen on any home computer, accompanied by a charming musical score. There are four different game scenes involved, and your performance in earlier ones will affect your ability to get through later ones and determine your eventual total score.

Scene One - Stunning title page graphics give way to the first game scene as Alice falls into the rabbit's warren. Score points for collecting the objects to be found there - including keys to open doors, bottles to make her smaller, cakes to make her bigger!

Scene Two - Out in the garden the Cheshire cat looks on as Alice meets the pipe-smoking caterpillar. Help her to catch the bread-and-butterflies and the rocking-horse flies that change into the balls used in the croquet game in the last scene!

Scene Three - Alice is a pawn in the chess game where her opponents are the Jabberwocky and Tweedledum and Tweedledee. Help her across the board by protecting her with your 'white knight'!

Scene Four - The most bizarre croquet game ever! Help Alice hit the balls through the playing-card-soldier hoops before the Queen of Hearts stamps on them!

Alice in Videoland is available for the Commodore 64 on disk - £12.95, and now on cassette - £8.95.

Alice in Videoland features graphics created with the Rasta Pad.

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For home, club or small business use **MUSICALC 1** should pay for itself in no time at all; the larger companies we recommend **MUSICALC II**, one of the few really valuable programs that you can turn to use in a day.

Although your Commodore 64 is a powerful musical instrument you need to be a pretty good programmer to understand how it all works. Unless, of course, you buy **MUSIC MASTER**.

To use **MUSIC MASTER** requires no prior musical knowledge, though in the hands of an experienced musician it will prove an invaluable tool. You don't need to know the first thing about programming either! **MUSIC MASTER** is the musical equivalent of a word processor, remembering the notes you play and allowing you to replay and edit them at your wish.

INTERDICTOR PILOT is a space flight simulator. Nowadays simulators are widely used to train pilots and astronauts because — to be frank — it's a lot cheaper (and safer) than the real thing!

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Of course, we do also publish games programs, and with classics like **STIX**, **QUICK** and **KRAM-KRAM** in our range we are one of the market leaders. But we most enjoy coming up with the sort of programs that are going to be in use for months and years, not hours and days — the sort of programs that make you glad that you bought a computer — and glad that you bought SUPERSOFT!

You won't find SUPERSOFT products on the shelves of your local supermarket. But most computer shops stock titles from our extensive range (and are prepared to obtain other programs to order). However you can also buy direct by sending a cheque (or past orders are post free), by calling at our offices, or over the telephone using your ACCESS card.



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